HIGHLIGHTS THIS YEAR:
• New cancer survival rates
• Nutrition and cancer • Cancer prevention

# 1985 CANCER FACTS & FIGURES

AMERICAN CANCER SOCIETY®

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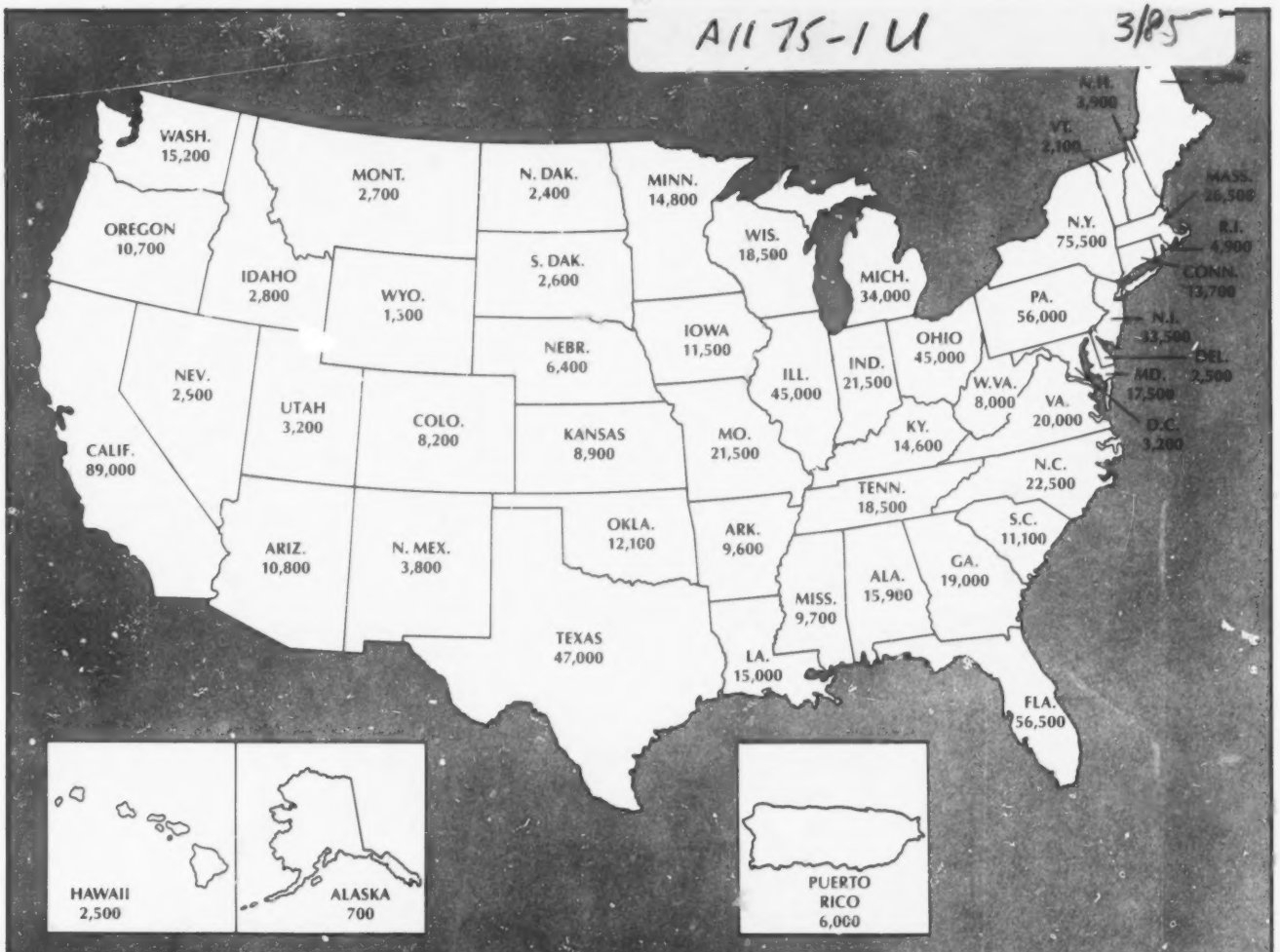


Estimated number of new cancer cases in 1985 by states, in all: 910,000* (excluding Puerto Rico).

*Excluding non-melanoma skin cancer and carcinoma in situ.
*BASED ON RATES FROM NCI SEER PROGRAM (1977-1981).*

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*Table/Chart

# SOURCES OF STATISTICS

## Incidence

Since there is no national office which records every new cancer case, there is no way of knowing exactly how many new cases of cancer are diagnosed each year. In the past, estimates of cancer incidence were made by extrapolating from the experience of the few population-based cancer registries.

Estimates of incidence in Facts & Figures editions prior to 1974 were based on data from two state cancer registries. The issues from 1974 through 1978 used information from the National Cancer Institute's Third National Cancer Survey (1969-1971) of nine major areas of the United States.

Then in 1973, NCI began a new and larger program, gathering data from 11 population-based registries. It is called SEER, standing for Surveillance, Epidemiology and End Results. Beginning with the 1979 edition of Facts & Figures, SEER incidence information has been used. Each time a new data base is introduced, there may be some sharp changes in figures, due to the more accurate data. The changes do NOT indicate either a cancer epidemic or miracle cure.

For valid comparisons between years, incidence statistics from the 1974 through 1978 editions of Facts & Figures may be compared with one another, while those from the 1979 to 1984 editions may be compared.

The latest available information for this 1985 edition is SEER data from the years 1977-1981.

## Mortality

The source for mortality statistics has remained constant over the years: the National Center for Health Statistics, Department of Health and Human Services.

The 1985 figures are estimates based on the latest available information, which includes mortality data through 1981.

Beginning with the 1981 edition of Facts & Figures, mortality rates per 100,000 population were age-adjusted to the 1970 census population, rather than the 1940 census population. Comparing these charts and figures with those of previous years may indicate false trends.

## Survival

Because of the 5-year waiting period, survival statistics take longer to compile. In this edition, we show the latest survival rates for cases diagnosed in the late 1970's in the SEER program.


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# CANCER: BASIC DATA

## BASIC DATA

### What is cancer?

Cancer is a large group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled or checked, it results in death. However, many cancers can be cured if detected and treated promptly.

### How is cancer treated?

By surgery, X rays, radioactive substances, chemicals, hormones and immunotherapy.

### Who gets cancer?

Cancer strikes at any age. It kills more children 3 to 14 than any other disease. And cancer strikes more frequently with advancing age. In the 1970's, there were an estimated 3.5 million cancer deaths, over 6.5 million new cancer cases, and more than 10 million people under medical care for cancer.

### How many people alive today will get cancer?

About 71 million Americans now living will eventually have cancer; about 30%, according to present rates. Over the years, cancer will strike in approximately three out of four families.

### How many people alive today have ever had cancer?

There are over 5 million Americans alive today who have a history of cancer, 3 million of them with diagnosis five or more years ago. Most of these 3 million can be considered cured, while others still have evidence of cancer. By "cured" is meant that a patient has no evidence of disease and has the same life expectancy as a person who never had cancer.

The decision as to when a patient may be considered cured is one that must be made by the physician after examining the individual patient. For most forms of cancer, five years without symptoms following treatment is the accepted time. However, some patients can be considered cured after one year, others after three years, whereas some have to be followed much longer than five years.

### How many new cases will there be this year?

In 1985 about 910,000 people will be diagnosed as having cancer.*

### How many people are surviving cancer?

In the early 1900's few cancer patients had any hope of long-term survival. In the 1930's less than one in five was alive at least five years after treatment. In the 1940's it was one in four, and in the 1960's it was one in three.

Today, about 340,000 Americans, or 3 out of 8 patients who get cancer this year, will be alive 5 years after diagnosis. The gain from 1 in 3 to 3 in 8 represents about 50,000 persons this year. This 3 in 8, or about 39% is called the "observed" survival rate. When normal life expectancy is taken into consideration (factors such as dying of heart disease, accidents and diseases of old age) 49% will be alive 5 years after diagnosis. This is the "relative" survival rate, and is considered a more accurate yardstick of our battle against cancer.

### Could more people be saved?

Yes. About 160,000 people with cancer will probably die in 1985 who might have been saved by earlier diagnosis and prompt treatment.

### How many people will die?

This year about 462,000 will die of the disease — 1,266 people a day, about one every 68 seconds. Of every five deaths from all causes in the U.S., one is from cancer. In 1984 an estimated 452,000 Americans died of cancer. In 1983 it was 442,000; in 1982 the figure was 432,000.

### What is the national death rate?

There has been a steady rise in the age-adjusted** national death rate. In 1930 the number of cancer deaths per 100,000 population was 143. In 1940 it was 152. By 1950 it had risen to 158 and in 1981 the number was 167. The major cause of these increases has been cancer of the lung. Except for that form of cancer, age-adjusted cancer death rates for major sites are leveling off, and in some cases declining.

### Can cancer be prevented?

Some cancers, not all. Most lung cancers are caused by cigarette smoking, and most skin cancers by frequent overexposure to direct sunlight. These cancers can be prevented by avoiding their causes. Certain cancers caused by occupational-environmental factors can be prevented by eliminating or reducing contact with carcinogenic agents. See Prevention section, pp. 17-20.

*These estimates of the incidence of cancer are based upon data from the National Cancer Institute's SEER Program (1977-1981). Non-melanoma skin cancer and carcinoma in situ have not been included in the statistics. The incidence of non-melanoma skin cancer is estimated to be over 400,000.

**Age-adjusted — a method used to make valid statistical comparisons by assuming the same age distribution among different groups being compared.

# HOW CANCER WORKS

Normally, the cells that make up the body reproduce themselves in an orderly manner so that worn-out tissues are replaced, injuries are repaired and growth of the body proceeds.

Occasionally, certain cells undergo an abnormal change and begin a process of uncontrolled growth and spread: One cell divides into two, those redivide into four, and so on. These cells may grow into masses of tissue called tumors — some benign and others malignant (cancerous).

The danger of cancer is that it invades and destroys normal tissue. At the beginning, cancer cells usually remain at their original site, and the cancer is said to be localized. Later, some cancer cells may invade neighboring organs or tissue. This occurs either by direct extension of growth or by becoming detached and carried through the lymph or blood systems to other parts of the body. This is called metastasis of a cancer.

This spread may be regional — confined to one region of the body — when cells are trapped by lymph nodes. If left untreated, however, the cancer is likely to spread throughout the body. That condition is known as advanced cancer, and usually results in death.

Because a case of cancer becomes progressively more serious with each stage, it is important to detect cancer as early as possible. Aids to early detection include cancer's Seven Warning Signals and the cancer risk factors.

# TRENDS IN DIAGNOSIS AND TREATMENT

Cancer management today is becoming increasingly individualized both with respect to diagnostic procedures and treatment. Early detection is followed by a precise staging of the disease, and the use of more than one kind of therapy, often in combination.

A number of cancers, which only a few decades ago had very poor prognoses, are today being cured in many cases: acute lymphocytic leukemia in children, Hodgkin's disease, Burkitt's lymphoma, Ewing's sarcoma (a form of bone cancer), Wilms' tumor (a form of kidney cancer in children), rhabdomyosarcoma (a cancer that forms in certain muscle tissue), choriocarcinoma (placental cancer), testicular cancer, ovarian cancer and osteogenic sarcoma. Other cancers are being more effectively controlled than in the past.

An outstanding example of progress is the improvement in the management of testicular cancer in young men. Better disease staging in certain cases, and the use of new and improved combinations of cancer drugs has resulted in remarkably improved survival. In less than 20 years, the five-year survival rate for all cases rose from 63% to 82% for these cancers.

The following developments indicate the directions of current and future research:

- A genetic fusing of cancer cells can produce disease-fighting "monoclonal antibodies" — specific antibodies tailored to seek out chosen targets on cancer cells. The potential that monoclonal antibodies can be used in the diagnosis and treatment of cancer is under study.
- A series of chemical injections near the spine can act as a nerve block, relieving certain cancer patients of debilitating pain. Understanding the effect of available analgesics has made the control of chronic pain more effective. Using oral pain medicine on a regular basis can relieve pain for most cancer patients.
- Chemoprevention studies with agents like synthetic retinoids (cousins of Vitamin A), betacarotene, folic acid, and other vitamins and minerals are being undertaken to see if recurrences of certain cancers can be prevented. The next step is to see if these agents can reduce cancer in high risk persons. Studies of dietary intervention will examine the effect of low-fat diets in women with stage II breast cancer.
- About fifty drugs have been found effective against certain cancers, and others that are still being tested hold promise.
- Many patients with bone cancer now are treated successfully by removing and replacing a section of bone rather than by amputating the leg or arm. Drugs and radiation therapy are being used effectively following surgery, resulting in dramatic improvement in survival.
- Computerized tomography (CT scanning) uses X rays to examine the brain and other parts of the body. Cross-section pictures are constructed which show a tumor's shape and location more accurately than is possible with conventional x-ray techniques.
  For patients undergoing radiation therapy, CT Scanning may enable the therapist to pinpoint the tumor more precisely in order to provide more accurate radiation dosage while sparing normal tissue.
- Immunotherapy holds hope of harnessing the body's own disease-fighting systems to combat cancer with minimal toxicity.
- Many cancers are caused by a two-stage process through exposure to two different kinds of substances known as initiators and promotors. Researchers are exploring ways of interrupting the process, thereby preventing the development of cancer.
- The transfusion of blood components is becoming increasingly available and effective as a support in cancer therapy. Platelets are used to prevent hemorrhaging, and red blood cells to combat anemia. The control of infection, a common complication in cancer patients, can be better controlled due to new understanding of antibiotic treatment and newer antibodies.
- New technologies have made it possible to use bone marrow transplantation as an important treatment option in selected patients with leukemia and aplastic

anemia. Its effect in other cancers is being studied.

- Hyperthermia, the use of heat to kill cancer cells, may play a vital role in future cancer treatment. Hyperthermia is being studied in combination with radiation therapy or chemotherapeutic drugs to determine if a synergistic response can be produced.
- With medical progress producing longer survival periods for cancer patients, clinical concerns are expanding to include not only patients' physical well-being, but also their psychosocial needs. The patient's and family's reactions to the disease, sexual concerns, employment and insurance needs and ways to provide psychosocial support have emerged as important areas of research and clinical care.
- Nuclear Magnetic Resonance (NMR) is another noninvasive imaging technique. It uses a huge electromagnet to detect tumors by sensing the vibrations of the different atoms in the body. NMR could revolutionize the diagnosis of cancer and other diseases.
- HTLV (human T-cell leukemia virus) is believed by many to be the first bona fide cancer virus in humans. This discovery has made possible the detection of antibodies in people who may be at high risk to a particular leukemia. It is hoped that soon a vaccine can be made to prevent this type of cancer.
- Breast reconstruction can be an important rehabilitation choice for women who have had a mastectomy for breast cancer.
- Intraoperative radiation is being studied as a way to give x-ray treatment at the time of surgery. The technique can give doses of X ray directly to the tumor and may be able to eliminate residual cancer cells.
- Improvements in chemotherapy, radiation therapy and surgical techniques have made possible more conservative management of early cancers. This has meant in the case of early larynx cancers that many patients have been able to retain their voice; and in colorectal cancers fewer permanent colostomies are needed.
- Techniques such as thermography (heat patterns), ultrasound (high-frequency sound waves) and diaphonoscopy (inspection with a beam of light) are currently being studied for their possible effectiveness and appropriate use in detecting early breast cancer.

## HOW TO ESTIMATE CANCER STATISTICS LOCALLY

| Community Population | Estimated No. Who are Alive, Saved from Cancer | Estimated No. Cancer Cases Under Medical Care in 1985 | Estimated No. Who Will Die of Cancer in 1985 | Estimated No. of New Cases in 1985 | Estimated No. Who Will be Saved from Cancer in 1985 | Estimated No. Who Will Eventually Develop Cancer | Estimated No. Who Will Die of Cancer if Present Rates Continue |
|---|---|---|---|---|---|---|---|
| 1,000 | 10 | 5 | 1 | 3 | 1 | 280 | 180 |
| 2,000 | 20 | 11 | 4 | 7 | 3 | 560 | 360 |
| 3,000 | 30 | 16 | 5 | 10 | 4 | 840 | 540 |
| 4,000 | 40 | 21 | 7 | 13 | 5 | 1,120 | 720 |
| 5,000 | 50 | 26 | 9 | 16 | 6 | 1,400 | 900 |
| 10,000 | 100 | 52 | 18 | 33 | 12 | 2,800 | 1,800 |
| 25,000 | 250 | 131 | 45 | 79 | 30 | 7,000 | 4,500 |
| 50,000 | 500 | 162 | 90 | 158 | 59 | 14,000 | 9,000 |
| 100,000 | 1,000 | 525 | 180 | 325 | 122 | 28,000 | 18,000 |
| 200,000 | 2,000 | 1,050 | 360 | 650 | 244 | 56,000 | 36,000 |
| 500,000 | 5,000 | 2,625 | 900 | 1,575 | 590 | 140,000 | 90,000 |

NOTE: The figures can only be the roughest approximation of actual data for your community and should be used with caution. It is suggested that every effort be made to obtain actual data from a Registry source.

## NEW CANCER CASES—1985

### Estimated New Cancer Cases for All Sites Plus Major Sites, by State—1985

| | ALL SITES* | MAJOR SITES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| STATE | Number of Cases | Female Breast | Colon-Rectum | Lung | Oral | Uterus | Prostate | Stomach | Pancreas | Leukemia |
| Alabama | 15,900 | 1,700 | 1,800 | 2,700 | 425 | 1,100 | 1,700 | 350 | 425 | 450 |
| Alaska | 700 | 75 | 50 | 125 | 15 | 25 | 75 | 20 | 10 | 20 |
| Arizona | 10,800 | 1,300 | 1,500 | 1,800 | 275 | 525 | 1,000 | 200 | 250 | 225 |
| Arkansas | 9,600 | 1,000 | 1,200 | 1,700 | 300 | 600 | 1,100 | 200 | 300 | 300 |
| California | 89,000 | 12,200 | 13,100 | 14,100 | 2,800 | 4,800 | 8,300 | 2,700 | 2,600 | 2,500 |
| Colorado | 8,200 | 1,000 | 1,200 | 1,200 | 200 | 400 | 800 | 200 | 250 | 250 |
| Connecticut | 13,700 | 2,300 | 2,100 | 1,900 | 500 | 750 | 1,400 | 400 | 400 | 400 |
| Delaware | 2,500 | 325 | 375 | 400 | 80 | 150 | 200 | 60 | 50 | 40 |
| Dist. of Columbia | 3,200 | 450 | 400 | 450 | 200 | 275 | 375 | 100 | 100 | 60 |
| Florida | 56,500 | 6,600 | 8,200 | 9,500 | 1,900 | 2,800 | 5,800 | 1,300 | 1,400 | 1,400 |
| Georgia | 19,000 | 2,000 | 2,300 | 3,300 | 700 | 1,200 | 2,000 | 400 | 450 | 500 |
| Hawaii | 2,500 | 325 | 350 | 400 | 100 | 100 | 175 | 200 | 60 | 70 |
| Idaho | 2,800 | 475 | 325 | 375 | 75 | 150 | 275 | 70 | 80 | 100 |
| Illinois | 45,000 | 6,200 | 7,200 | 7,300 | 1,600 | 2,500 | 3,800 | 1,400 | 1,300 | 1,300 |
| Indiana | 21,500 | 2,900 | 3,400 | 3,600 | 500 | 1,600 | 1,900 | 450 | 550 | 550 |
| Iowa | 11,500 | 1,500 | 2,500 | 1,700 | 300 | 600 | 1,200 | 300 | 350 | 400 |
| Kansas | 8,900 | 1,200 | 1,400 | 1,600 | 275 | 500 | 900 | 200 | 300 | 300 |
| Kentucky | 14,600 | 1,500 | 2,100 | 2,800 | 475 | 750 | 1,200 | 300 | 375 | 400 |
| Louisiana | 15,000 | 1,700 | 2,100 | 2,500 | 550 | 950 | 1,400 | 400 | 400 | 425 |
| Maine | 5,300 | 600 | 800 | 850 | 175 | 300 | 400 | 150 | 150 | 100 |
| Maryland | 17,500 | 2,600 | 2,800 | 2,900 | 700 | 1,000 | 1,500 | 400 | 400 | 400 |
| Massachusetts | 26,500 | 3,700 | 4,200 | 3,600 | 1,000 | 1,300 | 2,300 | 850 | 650 | 700 |
| Michigan | 34,000 | 4,400 | 4,900 | 5,500 | 1,000 | 2,000 | 3,500 | 900 | 850 | 950 |
| Minnesota | 14,800 | 2,100 | 2,400 | 2,000 | 375 | 800 | 1,600 | 500 | 450 | 500 |
| Mississippi | 9,700 | 900 | 1,300 | 1,600 | 275 | 600 | 1,100 | 275 | 300 | 300 |
| Missouri | 21,500 | 2,500 | 3,300 | 3,600 | 550 | 1,300 | 2,100 | 500 | 550 | 600 |
| Montana | 2,700 | 300 | 400 | 400 | 80 | 150 | 400 | 80 | 80 | 80 |
| Nebraska | 6,400 | 800 | 1,100 | 900 | 150 | 300 | 700 | 175 | 225 | 225 |
| Nevada | 2,900 | 325 | 350 | 550 | 70 | 150 | 200 | 20 | 60 | 40 |
| New Hampshire | 3,900 | 500 | 650 | 550 | 100 | 225 | 325 | 75 | 90 | 125 |
| New Jersey | 33,500 | 4,900 | 5,400 | 5,100 | 1,100 | 2,100 | 3,000 | 1,200 | 900 | 850 |
| New Mexico | 3,800 | 450 | 500 | 500 | 70 | 250 | 375 | 90 | 90 | 70 |
| New York | 75,500 | 11,900 | 13,000 | 10,900 | 2,700 | 4,700 | 6,700 | 2,800 | 2,400 | 2,100 |
| North Carolina | 22,500 | 2,800 | 3,000 | 3,500 | 750 | 1,400 | 2,400 | 425 | 600 | 500 |
| North Dakota | 2,400 | 375 | 425 | 275 | 60 | 125 | 300 | 100 | 80 | 70 |
| Ohio | 45,000 | 6,300 | 7,100 | 7,300 | 1,500 | 2,800 | 4,100 | 1,200 | 1,300 | 1,400 |
| Oklahoma | 12,100 | 1,300 | 1,900 | 2,200 | 375 | 600 | 1,100 | 300 | 325 | 325 |
| Oregon | 10,700 | 1,300 | 1,400 | 1,800 | 250 | 550 | 1,000 | 225 | 300 | 300 |
| Pennsylvania | 56,000 | 7,500 | 10,200 | 8,100 | 1,700 | 3,000 | 4,800 | 1,600 | 1,500 | 1,400 |
| Rhode Island | 4,900 | 650 | 950 | 700 | 225 | 250 | 400 | 200 | 150 | 80 |
| South Carolina | 11,100 | 1,300 | 1,400 | 1,800 | 350 | 800 | 1,200 | 200 | 300 | 250 |
| South Dakota | 2,600 | 425 | 475 | 400 | 50 | 125 | 300 | 80 | 90 | 100 |
| Tennessee | 18,500 | 2,000 | 2,600 | 3,300 | 550 | 1,100 | 1,600 | 350 | 500 | 500 |
| Texas | 47,000 | 5,600 | 6,100 | 7,600 | 1,600 | 2,600 | 4,200 | 1,300 | 1,200 | 1,500 |
| Utah | 3,200 | 475 | 425 | 275 | 70 | 175 | 400 | 80 | 80 | 80 |
| Vermont | 2,100 | 250 | 325 | 350 | 60 | 125 | 200 | 50 | 50 | 60 |
| Virginia | 20,000 | 2,400 | 2,600 | 3,400 | 600 | 1,100 | 2,100 | 425 | 475 | 450 |
| Washington | 15,200 | 850 | 2,200 | 2,600 | 475 | 800 | 1,400 | 375 | 425 | 475 |
| West Virginia | 8,000 | 2,100 | 1,000 | 1,400 | 200 | 550 | 650 | 200 | 250 | 200 |
| Wisconsin | 18,500 | 2,500 | 3,000 | 2,400 | 550 | 900 | 1,900 | 600 | 500 | 550 |
| Wyoming | 1,300 | 150 | 200 | 200 | 20 | 50 | 150 | 25 | 30 | 30 |
| United States | 910,000 | 119,000 | 138,000 | 144,000 | 29,000 | 52,000 | 86,000 | 25,000 | 25,000 | 25,000 |
| Puerto Rico | 6,000 | 450 | 450 | 350 | 425 | 750 | 400 | 500 | 100 | 175 |

* Does not include carcinoma in situ or non-melanoma skin cancer.

These estimates are offered as a rough guide and should not be regarded as definitive. They are calculated according to the distribution of estimated 1985 cancer deaths by state. Especially note that year-to-year changes may only represent improvements in the basic data.

## CANCER DEATHS—1985
## Estimated Cancer Deaths for All Sites Plus Major Sites, by State—1985

| | ALL SITES | | MAJOR SITES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STATE | Number of Deaths | Death Rate per 100,000 Population | Female Breast | Colon-Rectum | Lung | Oral | Uterus | Prostate | Stomach | Pancreas | Leukemia |
| Alabama | 8,000 | 197 | 550 | 800 | 2,400 | 125 | 200 | 425 | 200 | 400 | 300 |
| Alaska | 400 | 87 | 30 | 30 | 100 | 5 | 10 | 10 | 10 | 10 | 10 |
| Arizona | 5,500 | 164 | 400 | 600 | 1,700 | 100 | 50 | 250 | 125 | 250 | 175 |
| Arkansas | 4,900 | 201 | 325 | 550 | 1,700 | 100 | 100 | 300 | 150 | 275 | 225 |
| California | 45,600 | 178 | 3,800 | 5,600 | 12,600 | 850 | 900 | 2,400 | 1,500 | 2,400 | 1,700 |
| Colorado | 4,200 | 126 | 375 | 550 | 1,200 | 70 | 70 | 250 | 125 | 225 | 175 |
| Connecticut | 7,000 | 224 | 650 | 900 | 1,800 | 175 | 125 | 350 | 250 | 375 | 275 |
| Delaware | 1,300 | 212 | 100 | 200 | 325 | 25 | 20 | 60 | 30 | 60 | 40 |
| Dist. of Columbia | 1,600 | 281 | 175 | 200 | 375 | 75 | 60 | 100 | 60 | 100 | 40 |
| Florida | 29,000 | 252 | 2,200 | 3,600 | 8,000 | 450 | 400 | 1,600 | 800 | 1,500 | 850 |
| Georgia | 9,400 | 162 | 650 | 950 | 3,000 | 200 | 250 | 500 | 225 | 475 | 350 |
| Hawaii | 1,300 | 124 | 80 | 150 | 300 | 30 | 20 | 50 | 90 | 70 | 50 |
| Idaho | 1,500 | 139 | 125 | 150 | 300 | 25 | 25 | 90 | 40 | 75 | 70 |
| Illinois | 23,200 | 202 | 2,000 | 3,200 | 6,100 | 500 | 600 | 1,200 | 750 | 1,300 | 900 |
| Indiana | 11,000 | 197 | 950 | 1,500 | 3,200 | 200 | 300 | 550 | 250 | 550 | 425 |
| Iowa | 5,800 | 197 | 500 | 1,000 | 1,600 | 100 | 125 | 400 | 150 | 325 | 300 |
| Kansas | 4,700 | 195 | 425 | 650 | 1,500 | 100 | 100 | 300 | 125 | 250 | 200 |
| Kentucky | 7,500 | 194 | 500 | 950 | 2,500 | 175 | 175 | 400 | 150 | 375 | 275 |
| Louisiana | 7,800 | 174 | 550 | 850 | 2,300 | 175 | 175 | 450 | 250 | 450 | 300 |
| Maine | 2,600 | 221 | 225 | 350 | 650 | 50 | 60 | 150 | 90 | 150 | 80 |
| Maryland | 8,800 | 202 | 700 | 1,200 | 2,700 | 200 | 175 | 450 | 225 | 400 | 275 |
| Massachusetts | 13,100 | 229 | 1,200 | 2,000 | 3,300 | 325 | 275 | 650 | 500 | 650 | 450 |
| Michigan | 17,200 | 184 | 1,400 | 2,200 | 4,600 | 325 | 400 | 950 | 475 | 850 | 650 |
| Minnesota | 7,500 | 177 | 650 | 1,000 | 1,900 | 150 | 125 | 500 | 250 | 425 | 350 |
| Mississippi | 4,800 | 182 | 325 | 550 | 1,500 | 90 | 100 | 350 | 125 | 300 | 200 |
| Missouri | 10,800 | 216 | 800 | 1,400 | 3,000 | 200 | 250 | 600 | 275 | 500 | 400 |
| Montana | 1,400 | 167 | 100 | 175 | 350 | 30 | 30 | 125 | 50 | 90 | 60 |
| Nebraska | 3,300 | 206 | 275 | 500 | 800 | 60 | 70 | 225 | 125 | 200 | 175 |
| Nevada | 1,500 | 145 | 100 | 150 | 400 | 25 | 20 | 50 | 10 | 70 | 30 |
| New Hampshire | 2,000 | 194 | 175 | 300 | 425 | 40 | 40 | 90 | 40 | 90 | 70 |
| New Jersey | 17,000 | 229 | 1,600 | 2,400 | 4,300 | 350 | 375 | 850 | 650 | 850 | 550 |
| New Mexico | 1,900 | 134 | 150 | 200 | 375 | 25 | 40 | 90 | 50 | 100 | 60 |
| New York | 38,400 | 226 | 4,000 | 5,800 | 9,400 | 850 | 950 | 1,900 | 1,600 | 2,100 | 1,400 |
| North Carolina | 11,200 | 181 | 800 | 1,200 | 3,000 | 225 | 275 | 650 | 250 | 500 | 400 |
| North Dakota | 1,200 | 180 | 100 | 175 | 225 | 20 | 20 | 90 | 60 | 80 | 50 |
| Ohio | 22,900 | 212 | 1,900 | 3,100 | 6,100 | 425 | 600 | 1,200 | 650 | 1,200 | 800 |
| Oklahoma | 6,100 | 187 | 425 | 800 | 2,000 | 100 | 100 | 350 | 150 | 300 | 250 |
| Oregon | 5,300 | 178 | 400 | 600 | 1,600 | 100 | 75 | 325 | 125 | 275 | 200 |
| Pennsylvania | 28,200 | 239 | 2,400 | 4,300 | 6,800 | 500 | 700 | 1,400 | 850 | 1,400 | 950 |
| Rhode Island | 2,500 | 263 | 250 | 400 | 600 | 60 | 40 | 150 | 100 | 100 | 70 |
| South Carolina | 5,600 | 168 | 400 | 550 | 1,600 | 100 | 125 | 325 | 125 | 300 | 175 |
| South Dakota | 1,400 | 202 | 125 | 200 | 300 | 20 | 30 | 100 | 50 | 100 | 80 |
| Tennessee | 9,300 | 192 | 600 | 1,000 | 2,800 | 200 | 200 | 475 | 225 | 450 | 325 |
| Texas | 23,700 | 149 | 1,700 | 2,600 | 6,700 | 425 | 500 | 1,300 | 700 | 1,300 | 1,000 |
| Utah | 1,600 | 91 | 150 | 175 | 225 | 20 | 30 | 100 | 50 | 80 | 70 |
| Vermont | 1,100 | 203 | 90 | 150 | 275 | 20 | 30 | 70 | 30 | 50 | 40 |
| Virginia | 10,000 | 177 | 750 | 1,200 | 3,000 | 175 | 225 | 500 | 250 | 475 | 325 |
| Washington | 7,700 | 168 | 600 | 950 | 2,400 | 150 | 150 | 425 | 200 | 400 | 300 |
| West Virginia | 4,100 | 206 | 275 | 475 | 1,300 | 75 | 100 | 225 | 100 | 200 | 150 |
| Wisconsin | 9,400 | 193 | 900 | 1,400 | 2,200 | 175 | 175 | 600 | 325 | 500 | 375 |
| Wyoming | 700 | 119 | 50 | 70 | 175 | 10 | 10 | 50 | 15 | 50 | 30 |
| United States | 462,000 | 194 | 38,000 | 60,000 | 126,000 | 9,000 | 10,000 | 25,000 | 14,000 | 24,000 | 17,000 |
| Puerto Rico | 3,000 | 94 | 125 | 125 | 300 | 175 | 150 | 225 | 400 | 100 | 150 |

## ESTIMATED NEW CANCER CASES AND DEATHS BY SEX FOR ALL SITES — 1985*

| | ESTIMATED NEW CASES | | | ESTIMATED DEATHS | | |
|---|---|---|---|---|---|---|
| | Both Sexes | Male | Female | Both Sexes | Male | Female |
| **ALL SITES** | 910,000* | 455,000* | 455,000* | 462,000 | 249,000 | 213,000 |
| Buccal Cavity & Pharynx (**ORAL**) | 28,900 | 19,500 | 9,400 | 9,500 | 6,450 | 3,050 |
| Lip | 4,500 | 4,000 | 500 | 175 | 150 | 25 |
| Tongue | 5,200 | 3,300 | 1,900 | 2,050 | 1,400 | 650 |
| Mouth | 10,400 | 6,100 | 4,300 | 2,975 | 1,900 | 1,075 |
| Pharynx | 8,800 | 6,100 | 2,700 | 4,300 | 3,000 | 1,300 |
| Digestive Organs | 215,200 | 109,500 | 105,700 | 119,800 | 62,600 | 57,200 |
| Esophagus | 9,400 | 6,600 | 2,800 | 8,800 | 6,400 | 2,400 |
| Stomach | 24,700 | 15,000 | 9,700 | 14,300 | 8,400 | 5,900 |
| Small Intestine | 2,200 | 1,100 | 1,100 | 800 | 400 | 400 |
| Large Intestine (**COLON-RECTUM**) | 96,000 | 44,000 | 52,000 | 51,600 | 24,600 | 27,000 |
| Rectum (**COLON-RECTUM**) | 42,000 | 22,000 | 20,000 | 8,300 | 4,400 | 3,900 |
| Liver & Biliary Passages | 13,400 | 6,700 | 6,700 | 10,400 | 5,200 | 5,200 |
| Pancreas | 25,200 | 13,000 | 12,200 | 24,200 | 12,500 | 11,700 |
| Other & Unspecified Digestive | 2,300 | 1,100 | 1,200 | 1,400 | 700 | 700 |
| Respiratory System | 159,200 | 110,100 | 49,100 | 130,650 | 90,900 | 39,750 |
| Larynx | 11,500 | 9,500 | 2,000 | 3,750 | 3,100 | 650 |
| **LUNG** | 144,000 | 98,000 | 46,000 | 125,600 | 87,000 | 38,600 |
| Other & Unspecified Respiratory | 3,700 | 2,600 | 1,100 | 1,300 | 800 | 500 |
| Bone | 2,000 | 1,100 | 900 | 1,400 | 800 | 600 |
| Connective Tissue | 5,000 | 2,700 | 2,300 | 2,800 | 1,300 | 1,500 |
| **SKIN** | 22,000** | 11,000** | 11,000** | 7,400† | 4,400 | 3,000 |
| **BREAST** | 119,900*** | 900*** | 119,000*** | 38,700 | 300 | 38,400 |
| Genital Organs | 167,200 | 92,300 | 74,900 | 48,850 | 26,450 | 22,400 |
| Cervix Uteri (**UTERUS**) | 15,000*** | — | 15,000*** | 6,800 | — | 6,800 |
| Corpus, Endometrium (**UTERUS**) | 37,000 | — | 37,000 | 2,900 | — | 2,900 |
| Ovary | 18,500 | — | 18,500 | 11,600 | — | 11,600 |
| Other & Unspecified Genital, Female | 4,400 | — | 4,400 | 1,100 | — | 1,100 |
| Prostate | 86,000 | 86,000 | — | 25,500 | 25,500 | — |
| Testis | 5,000 | 5,000 | — | 500 | 500 | — |
| Other & Unspecified Genital, Male | 1,300 | 1,300 | — | 450 | 450 | — |
| Urinary Organs | 59,700 | 41,500 | 18,200 | 19,700 | 12,700 | 7,000 |
| Bladder | 40,000 | 29,000 | 11,000 | 10,800 | 7,300 | 3,500 |
| Kidney & Other Urinary | 19,700 | 12,500 | 7,200 | 8,900 | 5,400 | 3,500 |
| Eye | 1,800 | 900 | 900 | 400 | 200 | 200 |
| Brain & Central Nervous System | 13,700 | 7,700 | 6,000 | 10,100 | 5,500 | 4,600 |
| Endocrine Glands | 11,700 | 3,500 | 8,200 | 1,700 | 700 | 1,000 |
| Thyroid | 10,600 | 2,900 | 7,700 | 1,100 | 400 | 700 |
| Other Endocrine | 1,100 | 600 | 500 | 600 | 300 | 300 |
| Leukemias | 24,600 | 13,600 | 11,000 | 17,200 | 9,500 | 7,700 |
| Lymphocytic Leukemia | 11,800 | 6,700 | 5,100 | 6,500 | 3,800 | 2,700 |
| Granulocytic Leukemia | 12,100 | 6,500 | 5,600 | 10,300 | 5,500 | 4,800 |
| Monocytic Leukemia | 700 | 400 | 300 | 400 | 200 | 200 |
| Other Blood & Lymph Tissues | 43,300 | 22,400 | 20,900 | 22,300 | 11,500 | 10,800 |
| Hodgkin's Disease | 6,900 | 3,900 | 3,000 | 1,500 | 900 | 600 |
| Multiple Myeloma | 9,900 | 5,000 | 4,900 | 7,400 | 3,800 | 3,600 |
| Other Lymphomas | 26,500 | 13,500 | 13,000 | 13,400 | 6,800 | 6,600 |
| All Other & Unspecified Sites | 35,800 | 18,300 | 17,500 | 31,500 | 15,700 | 15,800 |

NOTE: The estimates of new cancer cases are offered as a rough guide and should not be regarded as definitive. Especially note that year-to-year changes may only represent improvements in the basic data. ACS six major sites in boldface caps.

*Carcinoma in situ and non-melanoma skin cancers not included in totals. Carcinoma in situ of the uterine cervix accounts for over 45,000 new cases annually and carcinoma in situ of the female breast accounts for over 5,000 new cases annually. Non-melanoma skin cancer accounts for over 400,000 new cases annually.

**Melanoma only. ***Invasive cancer only.

INCIDENCE ESTIMATES ARE BASED ON RATES FROM NCI SEER PROGRAM 1977-1981.

# MAJOR CANCER SITES

## LUNG CANCER

**Incidence:** An estimated 144,000 new cases in 1985.

**Mortality:** An estimated 126,000 deaths in 1985. The age-standardized lung cancer death rate for women is more than that of colorectal cancer, and by 1986 will surpass breast cancer to become the number one cancer killer of women. Those who smoke two or more packs of cigarettes a day have lung cancer mortality rates 15 to 25 times greater than nonsmokers, according to the 1982 Surgeon General's Report.

**Warning Signals:** A persistent cough; sputum streaked with blood; chest pain; recurring attacks of pneumonia or bronchitis.

**Risk Factors:** Cigarette smoking; history of smoking 20 or more years; exposure to certain industrial substances such as asbestos, particularly for those who smoke.

**Early Detection:** Lung cancer is very difficult to detect early; symptoms often don't appear until the disease has advanced considerably. If a smoker quits at the time of early precancerous cellular changes, the damaged bronchial lining often returns to normal. If a smoker continues the habit, cells may form abnormal growth patterns that lead to cancer. Diagnosis may be aided by such procedures as the chest X ray, sputum cytology test and fiberoptic bronchoscopy.

**Treatment:** Treatment depends on the type of, and stage of lung cancer. Surgery, radiation therapy and chemotherapy are all options. For many localized cancers, surgery is usually the treatment of choice. Since the majority of patients with lung cancer have tumor spread, radiation therapy and chemotherapy are often combined with surgery. In small cell cancer of the lung, chemotherapy alone or combined with radiation has largely replaced surgery as the treatment of choice, with a large percentage of patients experiencing remission — in some cases, long-lasting remission.

**Survival:** Only 13% of lung cancer patients (all stages, whites and blacks) live five or more years after diagnosis. The rate is 40% for cases detected in a localized stage; 20% of lung cancers are discovered that early. Rates have improved only slightly over a recent 10-year period.

## COLON AND RECTUM CANCER

**Incidence:** An estimated 138,000 new cases in 1985, including 96,000 of colon cancer and 42,000 of rectum cancer. Their combined incidence is second only to that of lung cancer (excluding common skin cancers).

**Mortality:** An estimated 59,900 deaths in 1985, second only to lung cancer. This includes 51,600 for colon cancer and 8,300 for rectum cancer.

**Warning Signals:** Bleeding from the rectum, blood in the stool, change in bowel habits.

**Risk Factors:** Personal or family history of colon and rectum cancer; personal or family history of polyps in the colon or rectum; inflammatory bowel disease.

Evidence suggests that bowel cancer may be linked to the diet. A diet high in fat and/or deficient in fiber content may be a significant causative factor.

**Early Detection:** The ACS recommends three tests as valuable aids in detecting colon and rectum cancer early in people without symptoms.

The digital rectal examination is performed by a physician during an office visit. The ACS recommends one every year after age 40.

The stool blood slide test is a simple method of testing the feces for hidden blood. The specimen is obtained by the patient at home, and returned to the physician's office, a hospital or clinic for examination. The ACS recommends the test every year after 50.

Proctosigmoidoscopy, known as the "procto," is an examination in which a physician inspects the rectum and lower colon with a hollow lighted tube, traditionally 25 cm long. As the site of most colorectal cancers appears to be shifting higher in the colon, longer, flexible instruments are being used. Now available is a 35 cm sigmoidoscope, thought to be useful in doctors' offices. The ACS recommends a procto every 3 to 5 years after the age of 50, following two annual exams with negative results.

If any of these tests reveals possible problems, a physician may recommend more extensive studies, such as colonoscopy and a barium enema. The longest available colonoscope is capable of viewing the entire colon with a flexible, lighted tube.

A national ACS study on colon and rectum cancer attitudes by the public* found that Americans over age 40 tend to pay these organs scant attention and have them checked infrequently by their physicians. Most study participants incorrectly thought the disease usually is found in an advanced stage when survival chances are slim. Many also erroneously regarded a permanent colostomy as a normal result of colon and rectum cancer. On the other hand, participants were receptive to accurate information about the disease, and expressed a willingness to practice early detection procedures.

**Treatment:** Surgery, at times combined with radiation, is the most effective method of treating colorectal cancer. Chemotherapy is being studied to determine its possible role in treating advanced cases.

In cases of colon cancer, permanent colostomies, the creation of an abdominal opening for the elimination of body wastes, are seldom needed, and infrequently required for patients with rectal cancer. One report found permanent colostomies necessary for only 15% of patients whose rectal cancers are detected early. For those who do have permanent colostomies, the Society has a special patient assistance program.

**Survival:** When colorectal cancer is detected and treated in an early, localized stage, the 5-year survival rate is 87% for colon cancer and 78% for rectal cancer, compared with 47% and 38% respectively, after the cancer has spread to other parts of the body.

*Leo J. Shapiro & Assoc., Inc., 1982.

# BREAST CANCER

**Incidence:** An estimated 119,000 new cases in the United States during 1985. About one out of 11 women will develop breast cancer at some time during their lives.

**Mortality:** An estimated 38,400 deaths in 1985. It is the foremost site of cancer deaths in women.

**Warning Signals:** Breast changes that persist such as a lump, thickening, swelling, dimpling, skin irritation, distortion, retraction or scaliness of the nipple, nipple discharge, pain or tenderness.

**Risk Factors:** Over age 50; personal or family history of breast cancer; never had children; first child after age 30.

**Early Detection:** The American Cancer Society recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine good health habit. Most breast lumps are not cancer, but only a physician can make a diagnosis.

The American Cancer Society and the National Cancer Institute, in their joint Breast Cancer Detection Demonstration program, found that mammography — a low-dose x-ray examination — could find cancers too small to be felt by the most experienced examiner.

Besides its effectiveness in screening women without symptoms, mammography is recognized as a valuable diagnostic technique for women who do have findings suggestive of breast cancer. Once a breast lump is found, mammography can help determine if there are other lesions in the same or opposite breast which are too small to be felt. All suspicious lumps should be biopsied for a definitive diagnosis — even when the mammogram is described as normal.

The Society recommends a mammogram every year for asymptomatic women age 50 and over, and a baseline mammogram for those 35 to 39. Asymptomatic women 40 to 49 should have mammography every 1-2 years, depending on physical and mammographic findings as well as other risk factors. In addition, a professional breast examination is recommended every three years for women 20 to 40, and every year for those over 40.

**Treatment:** Several methods may be used, depending on the individual woman's preferences and medical situation — surgery varying from local removal of the tumor to mastectomy, radiation therapy, chemotherapy or hormone manipulation. Often two or more methods may be used in combination. Patients should discuss with their physicians possible options available concerning the specific management of their breast cancer.

New techniques in recent years have made breast reconstruction possible after mastectomy, and the cosmetic results are good. Reconstruction now has become an important part of treatment and rehabilitation.

**Survival:** The 5-year survival rate for localized breast cancer has risen from 78% in the 1940's to 96% today. If the breast cancer is not invasive (in situ), the survival rate approaches 100 percent. If the cancer has spread, however, the rate is 70%.

Despite an increasing incidence of breast cancer, longer survival has helped to stabilize mortality rates over the last 50 years.

# SKIN CANCER

**Incidence:** Over 400,000 cases a year, the vast majority of which are highly curable basal or squamous cell cancers. They are more common among individuals with lightly pigmented skin, living at latitudes near the equator. The most serious skin cancer is malignant melanoma, which strikes about 22,000 men and women each year.

**Mortality:** An estimated 7,400 deaths a year, 5,500 from malignant melanoma, and 1,900 due to other skin cancers.

**Warning Signals:** Any unusual skin condition, especially a change in the size or color of a mole or other darkly pigmented growth or spot.

**Risk Factors:** Excessive exposure to the sun; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds and radium. Among blacks, because of heavy skin pigmentation, skin cancer is negligible.

**Prevention:** Avoid the sun between 10:00 a.m. and 3 p.m. when ultraviolet rays are strongest, and by using protective clothing. Use one of the growing number of sunscreen preparations, especially those containing such ingredients as PABA (para-aminobenzoic acid). They come in varying strengths, ranging from those that permit gradual tanning to those allowing practically no tanning at all.

**Early Detection:** Recognition of changes in scales or the appearance of new skin growths is the best way to find early skin cancer. Basal and squamous cell skin cancers often take the form of a pale, waxlike, pearly nodule, or a red, scaly, sharply outlined patch.

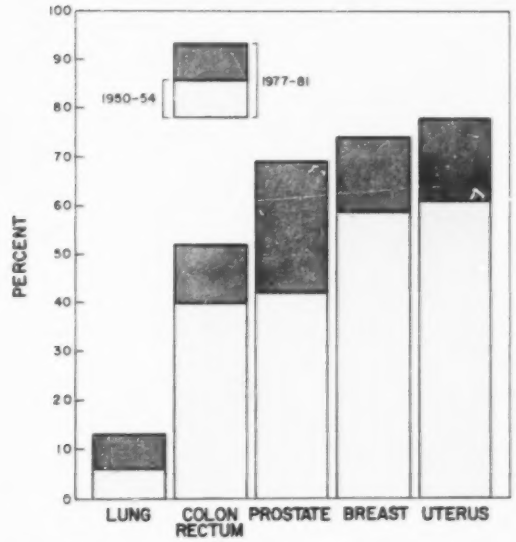
Melanomas are usually distinguished by a dark brown or black pigmentation. They start as small, mole-like growths that increase in size, change color, become ulcerated and bleed easily from a slight injury.

**Treatment:** There are four methods of treatment — surgery, radiation therapy, electrodesiccation (tissue destruction by heat), or cryosurgery (tissue destruction by freezing).

For malignant melanoma, adequate surgical excision of the primary growth is indicated. Nearby lymph nodes may be removed. The microscopic examination of all suspicious moles is essential.

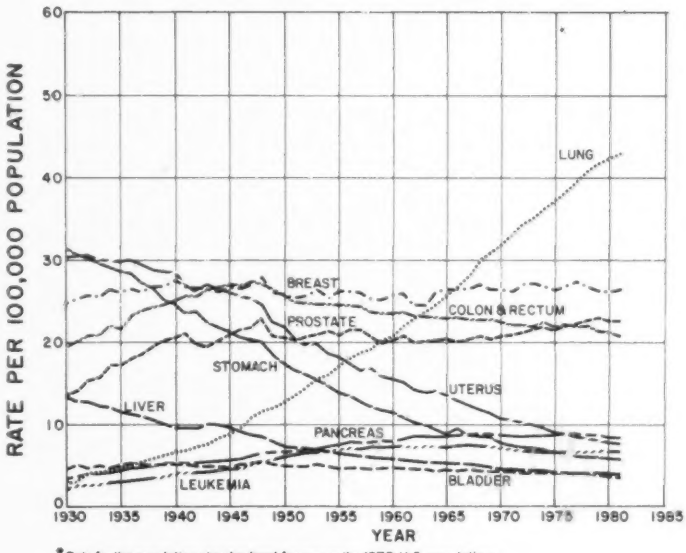
**Survival:** For basal cell and squamous cell cancers, cure is virtually assured with early detection and treatment. Malignant melanoma, however, can spread to other parts of the body quickly. The 5-year survival rate for white patients with malignant melanoma is 82% compared with 95% for patients with other kinds of skin cancer.

**FIVE YEAR CANCER SURVIVAL RATES* TRENDS FOR SELECTED SITES— 1950-54 to 1977-81**




*Adjusted for normal life expectancy.
Source: Biometry Branch, National Cancer Institute

**CANCER DEATH RATES* BY SITE UNITED STATES, 1930-81**




*Rate for the population standardized for age on the 1970 U.S. population
Sources of Data: National Center for Health Statistics and Bureau of the Census, United States.
Note: Rates are for both sexes combined except breast and uterus female population only and prostate male population only.

# UTERINE CANCER

**Incidence:** An estimated 52,000 new invasive cases in 1985, including 15,000 cases of cancer of the cervix, and 37,000 cases of cancer of the endometrium or body of the uterus. Invasive cervical cancer incidence has steadily decreased over the years, while cancer in situ has risen in all groups. Cervical cancer is most common today among low socioeconomic groups but all groups are at risk. Endometrial cancer afflicts mostly mature women, and diagnosis usually is made between the ages of 50 and 64.

**Mortality:** An estimated 6,800 deaths in 1985 from cervical cancer, 2,900 from endometrial cancer. Overall, the death rate from uterine cancer has decreased more than 70% during the last 40 years, due mainly to the Pap test and regular checkups.

**Warning Signals:** Intermenstrual or postmenopausal bleeding or unusual discharge.

**Risk Factors:** For cervical cancer, early age at first intercourse, multiple sex partners. For endometrial cancer: history of infertility, failure of ovulation, prolonged estrogen therapy and obesity.

**Early Detection:** The Pap test, an examination under a microscope of cells from the cervix and body of the uterus, is a simple procedure which can be performed at appropriate intervals by physicians as part of every pelvic examination. For the average risk person, a Pap test is recommended once every three years after two initial negative tests one year apart.

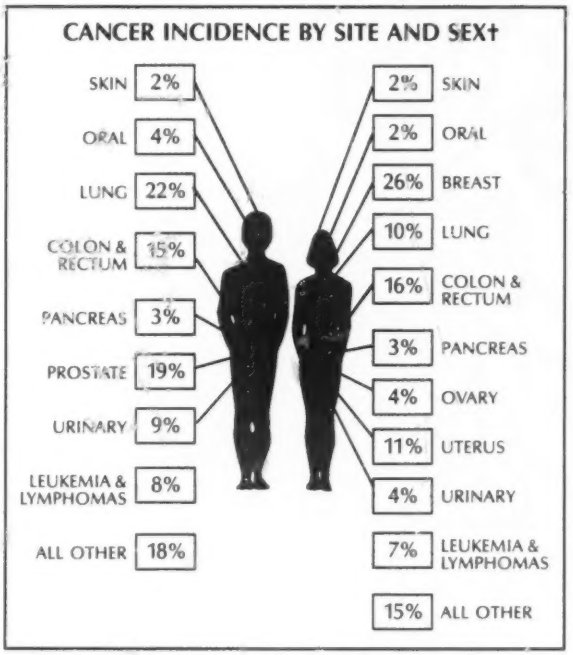
The Pap test is highly effective in detecting early cancer of the uterine cervix; it is only 50% effective in detecting endometrial cancer. Women at high risk of developing endometrial cancer should have an endometrial tissue sample at menopause.

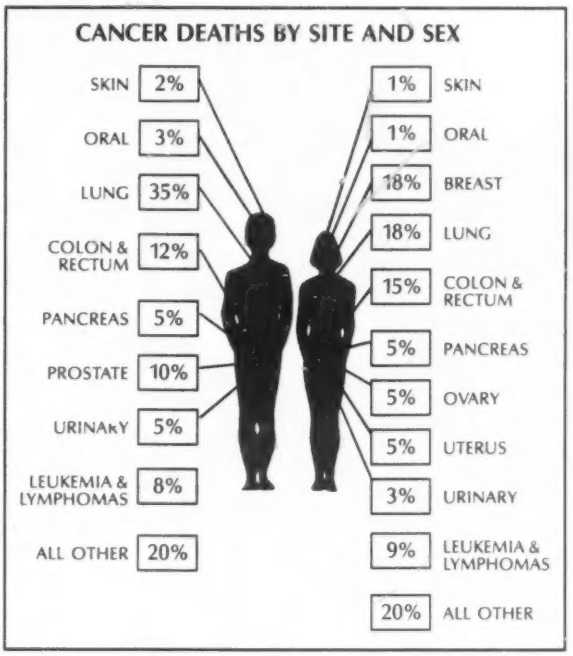
The hormone estrogen frequently is given to women during and after menopause to make up for the decline in estrogens normally produced by the ovaries. Estrogen helps to control menopausal symptoms such as hot flashes or thinning of the vaginal lining causing painful sexual intercourse. For older women, there are certain risks associated with such treatment, including an increased risk of endometrial cancer. However, estrogen can be given safely under careful physician control.

**Treatment:** Uterine cancers generally are treated by surgery or radiation, or by a combination of the two. In precancerous (in situ) stages, changes in the cervix may be treated by cryotherapy (the destruction of cells by extreme cold), by electrocoagulation (the destruction of tissue through intense heat by electric current) or by local surgery. Precancerous endometrial changes may be treated with the hormone progesterone.

**Survival:** The 5-year survival rate for cervical cancer patients, whites and blacks, is 65%. For patients diagnosed early, however, the rate is 80-90%. Cancer in situ is virtually 100%. The figures for endometrial cancer are 84% all stages, 91% early and virtually 100% for endometrial precancerous lesions. During a recent 10-year period, there was moderate improvement for both uterine sites.

## CANCER INCIDENCE AND DEATHS BY SITE AND SEX — 1985 ESTIMATES




†Excluding non-melanoma skin cancer and carcinoma in situ.

# LEUKEMIA

**Incidence:** An estimated 25,000 new cases in 1985, about half of them acute leukemia, and half of them chronic leukemia. Although it is often thought of as primarily a childhood disease, leukemia strikes many more adults (22,500 cases per year compared with 2,500 in children). Acute lymphocytic leukemia accounts for about 1,800 of the cases of leukemia among children, whereas in adults the most common types are acute granulocytic (about 6,800 cases annually), and chronic lymphocytic (7,600 cases annually).

**Mortality:** An estimated 17,000 deaths in 1985.

**Warning Signals:** Symptoms of acute leukemia in children can appear suddenly. Early signs may include fatigue, paleness, weight loss, repeated infections, easy bruising, nose bleeds or other hemorrhages. Chronic leukemia can progress slowly and with few symptoms.

**Risk Factors:** Leukemia, a cancer of the bloodforming tissues, strikes both sexes and all ages. Causes of most cases are unknown. Individuals with Down's syndrome (mongolism) and certain other hereditary abnormalities have higher than normal incidence of leukemia. It has also been linked to excessive exposure to radiation and certain chemicals such as benzene.

**Early Detection:** Leukemia may be difficult to diagnose early because symptoms often appear to be those of other less serious conditions. When a physician does suspect leukemia, a diagnosis can be made through blood tests and an examination of bone marrow.

**Treatment:** Chemotherapy is the most effective method of treating leukemia. Today, continuing research in 80 U.S. medical centers is yielding new and better drugs for treating leukemia patients. A variety of anticancer drugs are used, usually in combinations or as single agents. To prevent persistence of hidden cells, therapy of the central nervous system has become standard treatment, especially in acute lymphocytic leukemia. Under appropriate conditions, bone marrow transplantation may be useful in the treatment of certain leukemias.

When leukemia occurs, millions of abnormal, immature white blood cells are released into the circulatory systems. These abnormal cells crowd out normal white cells to fight infection, platelets to control hemorrhaging and red blood cells to prevent anemia. Transfusions of blood components and antibiotics are used as supportive treatments.

**Survival:** The overall, average 5-year survival rate for white patients with leukemia is 33%, due partly to very poor survival of patients with some types of leukemia such as acute granulocytic. The 5-year survival rate for black patients is 29%. Over a recent 10-year period, however, there was a dramatic improvement in survival of patients with acute lymphocytic leukemia: 4%-27% in white males, 3%-29% in white females. In white children, the improvement has been from 4% to 65%. Moreover, in some medical centers, optimum treatment has raised survival of children with acute lymphocytic leukemia up to 75%.

## ORAL CANCER

**Incidence:** An estimated 29,000 new cases in 1985. Incidence is more than twice as high in males as in females, and is most frequent in men over age 40. Cancer can affect any part of the oral cavity, from lip to tongue to mouth and throat.

**Mortality:** An estimated 9,500 deaths in 1985.

**Warning Signals:** A sore that bleeds easily and doesn't heal; a lump or thickening; a reddish or whitish patch that persists. Difficulty in chewing, swallowing or moving tongue or jaws are often late changes.

**Risk Factors:** Cigarette, cigar and pipe smoking; use of chewing tobacco; more than moderate drinking.

**Early Detection:** Dentists have the opportunity, through regular checkups, to see abnormal tissue changes and to detect cancer at an early and curable stage.

**Treatment:** Principal methods are radiation therapy and surgery. Chemotherapy is being studied as an aid to surgery in advanced disease.

**Survival:** 5-year survival rates vary substantially depending on the site, and include slight declines as well as improvements over a recent 10-year period. Rates range from 22% for cancer of the pharynx to 84% for lip cancer. Overall, 5-year survival for oral cancer patients is about 40%.

# CANCER BY AGE AND RACE

## CANCER RATES IN BLACKS AND WHITES*

A study of cancer rates over several decades shows that the cancer incidence rate for blacks is higher than for whites, and that blacks also have a higher death rate than whites.

Male incidence and mortality rates in each race increased, while female rates decreased.

The overall cancer incidence rate for blacks went up 27%, while for whites it increased 12%. Cancer mortality has increased in both races, but the rate for blacks is greater than for whites. In the last 30 years, cancer death rates in whites have increased 10%, while black rates have increased 40%. The rates were virtually the same 30 years ago.

Cancer sites where blacks had significantly higher increases in incidence and mortality rates included the lung, colon-rectum, prostate and esophagus. Esophageal cancer, long considered mainly a disease of males, declined in whites and rose rapidly in blacks of both sexes.

The incidence of invasive cancer of the uterine cervix dropped in both black and white women, although the incidence in blacks is still more than double that in whites. However, the rate for endometrial cancer — or cancer of the body of the uterus — for white women is double that of black women.

Survival for patients diagnosed between 1967 and 1973 was compared. More whites than blacks had cancer diagnosed in an early, localized stage when the chances of cure are best: 37% versus 28% for males, and 42% versus 31% for women.

A recent ACS-sponsored survey by the black-owned New York firm of Evaxx, Inc. showed that urban black Americans tend to be much less knowledgeable than whites about cancer's warning signals, and less apt to see a doctor if they experience those symptoms. Specifically, the blacks interviewed knew little about three of the cancers that have seen a sharp increase in mortality: colorectal, prostate and esophageal. The survey also showed that blacks tend to underestimate both the prevalence of cancer and the chances of cure.

In both studies, most of the differences between whites and blacks were attributed to economic, environmental and social factors rather than to inherent biological characteristics. Because a higher percentage of blacks than whites are in the lower socio-economic group, risk of exposure to industrial carcinogens is increased. Also, limited educational opportunities may prevent early detection because the less educated are less likely to know the importance of symptoms which could lead to an early diagnosis.

*Figures for cancer incidence are from the National Cancer Institute National Surveys, 1947, and the NCI SEER Program, 1973-1981; those for cancer mortality from the National Center for Health Statistics, 1949-51 to 1979-81.

# CANCER IN CHILDREN

**Incidence:** An estimated 6,000 new cases in 1985, making it rare as a childhood disease. Common childhood cancer sites include the blood (bone marrow), bone, brain, nervous system, kidneys and soft tissues.

**Mortality:** An estimated 1,600 deaths in 1985, about half of them from leukemia. Despite its rarity, cancer is still the chief cause of death by disease in children between the ages of 3 and 14. Mortality among children with cancer has declined from 8.3 per 100,000 in 1950 to 4.2 in 1981.

**Early Detection:** Cancers in children often are difficult to recognize since they may seem like trivial disorders at first. Parents should see that their children have regular medical checkups, and be alert to any unusual symptoms that persist. Such conditions include unusual lumps, double vision, nosebleeds, drowsiness, listlessness and failure to thrive.

## Main Childhood Cancers

*Leukemia:* See preceding section.

*Osteogenic Sarcoma* and *Ewing's Sarcoma* are bone cancers. There may be no pain at first, but swelling in the area of the tumor is often a first sign.

*Neuroblastoma*, or *Cancers of the Nervous System*, can appear anywhere but usually in the abdomen, where a swelling occurs.

*Rhabdomyosarcoma*, the most common soft tissue sarcoma, can occur in the head and neck area, genito-urinary area, trunk and extremities.

*Brain Cancers* in early stages may cause headaches, blurred or double vision, dizziness, difficulty in walking or handling objects, and nausea.

*Lymphomas*, or *Hodgkin's Disease* are cancers that involve the lymph nodes, bone marrow and various organs throughout the body. They may cause swelling of lymph nodes in the neck, armpit or groin. Other symptoms may include general weakness and possibly fever.

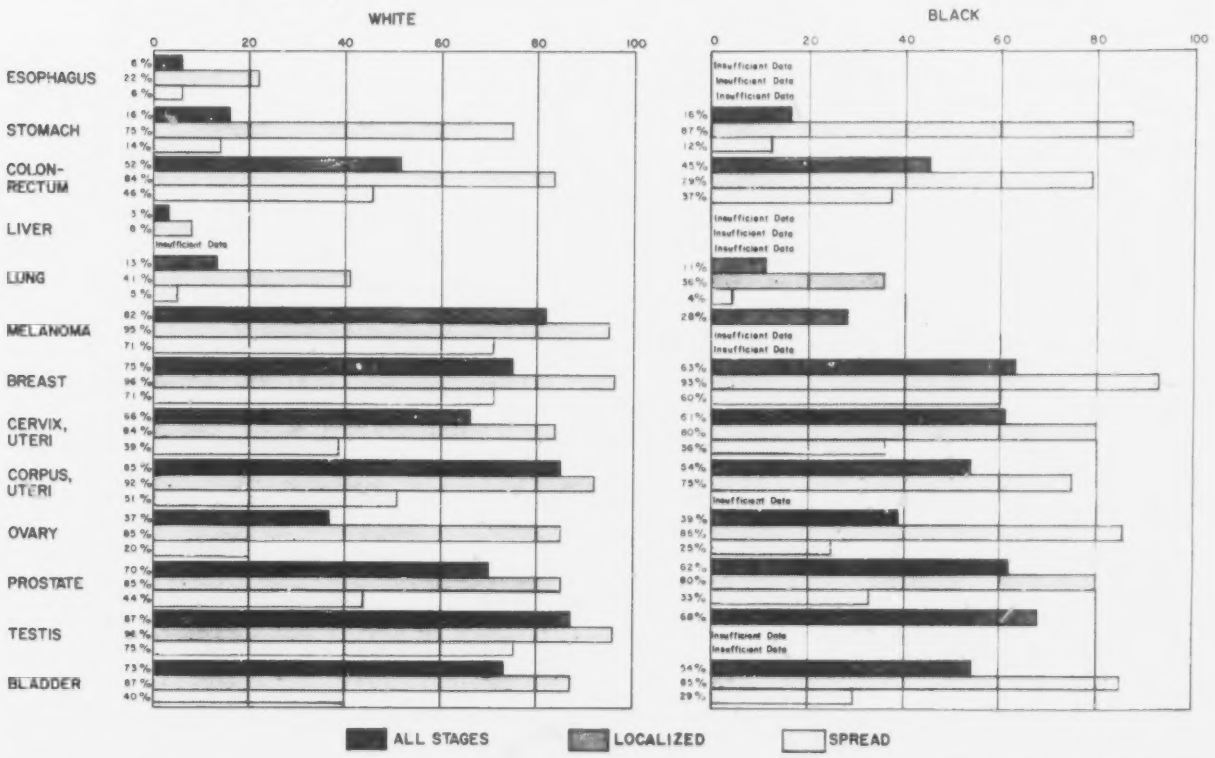
*Eye Cancers*, or *Retinoblastoma* usually occur in children under the age of four. When detected early, cure is possible with appropriate treatment.

*Cancer of the Kidney*, or *Wilms' Tumor* may be recognized by a swelling or lump in the abdomen.

**Treatment:** Childhood cancers are frequently treated by a combination of therapies, coordinated by a team of experts. They include medical specialists, pediatric nurses, social workers and psychologists who work with children and their families.

**Survival:** 5-year survival rates for cancer in children vary considerably, depending on the site. Among those for white children (black information is insufficient) are: bone cancer, 45%; neuroblastoma, 51%; brain and central nervous system, 53%; Wilms' tumor (kidney), 78%; and Hodgkin's disease, 88%.

## FIVE YEAR CANCER SURVIVAL RATES* FOR SELECTED SITES BY RACE




*Adjusted for normal life expectancy

This chart is based on cases diagnosed in 1977-1981.

Source: Biometry Branch, National Cancer Institute

## TRENDS IN SURVIVAL BY SITE OF CANCER, BY RACE
## Cases Diagnosed in 1960-63, 1970-73, 1973-75, 1976-81

| SITE | WHITE | | | | BLACK | | | |
|---|---|---|---|---|---|---|---|---|
| | RELATIVE 5-YEAR SURVIVAL | | | | RELATIVE 5-YEAR SURVIVAL | | | |
| | 1960-63[1] | 1970-73[1] | 1973-75[2] | 1976-81[2] | 1960-63[1] | 1970-73[1] | 1973-75[2] | 1976-81[2] |
| Esophagus | 4 | 4 | 5 | 6 | 1 | 4 | 2 | 4 |
| Stomach | 11 | 13 | 14 | 15 | 8 | 13 | 14 | 16 |
| Colon | 43 | 49 | 49 | 53 | 34 | 37 | 44 | 47 |
| Rectum | 38 | 45 | 47 | 49 | 27 | 30 | 35 | 39 |
| Lung and Bronchus | 8 | 10 | 12 | 13 | 5 | 7 | 10 | 11 |
| Melanoma of Skin | 60 | 68 | 76 | 80 | • | • | • | • |
| Breast | 63 | 68 | 74 | 75 | 46 | 51 | 63 | 63 |
| Uterine Cervix | 58 | 64 | 68 | 67 | 47 | 61 | 62 | 63 |
| Uterine Corpus | 73 | 81 | 89 | 86 | 31 | 44 | 59 | 55 |
| Ovary | 32 | 36 | 36 | 37 | 32 | 32 | 37 | 40 |
| Prostate | 50 | 63 | 65 | 71 | 35 | 55 | 56 | 61 |
| Testis | 63 | 72 | 76 | 87 | • | • | 67 | 70 |
| Bladder | 53 | 61 | 73 | 74 | 24 | 36 | 44 | 54 |
| Kidney | 37 | 46 | 50 | 50 | 38 | 44 | 47 | 52 |
| Brain | 18 | 20 | 20 | 22 | 19 | 19 | 20 | 25 |
| Hodgkin's Disease | 40 | 67 | 67 | 74 | • | • | 68 | 70 |
| Non-Hodgkin's Lymphoma | 31 | 41 | 45 | 48 | • | • | 46 | 48 |
| Leukemia | 14 | 22 | 33 | 33 | • | • | 27 | 29 |

Source: Biometry Branch, National Cancer Institute

[1]Rates are based on data from a series of hospital registries and one population-based registry.

[2]Rates are from the SEER Program and include patients diagnosed through 1981 and follow-up on all patients through 1982. They are based on data from population-based registries in Connecticut, New Mexico, Utah, Iowa, Hawaii, Atlanta, Detroit, Seattle-Puget Sound, and San Francisco-Oakland.

*Rates could not be calculated because of insufficient number of cases.

## ESTIMATED NEW CASES AND DEATHS
## FOR MAJOR SITES OF CANCER — 1985*

| SITE | NO. OF CASES | DEATHS |
|---|---|---|
| Lung | 144,000 | 126,000 |
| Colon-Rectum | 138,000 | 60,000 |
| Breast (Female) | 119,000 | 38,000 |
| Prostate | 86,000 | 26,000 |
| Urinary | 60,000 | 20,000 |
| Uterus | 52,000** | 10,000 |
| Oral | 29,000 | 10,000 |
| Pancreas | 25,000 | 24,000 |
| Leukemia | 25,000 | 17,000 |
| Skin | 22,000*** | 7,000 |
| Ovary | 19,000 | 12,000 |

*Figures rounded to nearest 1,000.
**If carcinoma in situ is included, cases total over 100,000.
***Estimated new cases of non-melanoma over 400,000.
INCIDENCE ESTIMATES ARE BASED ON RATES FROM N.C.I. SEER PROGRAM 1977-1981.

## TRENDS IN AGE-ADJUSTED CANCER DEATH RATES* PER 100,000 POPULATION BY STATES FOR THE LAST THREE DECADES

| | ALL SITES | | |
|---|---|---|---|
| STATE | 1950-59 | 1960-69 | 1970-79 |
| Alabama | 133.0 | 144.6 | 161.4 |
| Alaska | — | 147.2 | 161.5 |
| Arizona | 130.8 | 143.3 | 145.1 |
| Arkansas | 123.7 | 140.4 | 155.4 |
| California | 154.5 | 159.2 | 166.2 |
| Colorado | 141.8 | 136.6 | 137.1 |
| Connecticut | 180.5 | 175.5 | 177.8 |
| Delaware | 164.9 | 176.2 | 189.8 |
| Dist. of Columbia | 205.0 | 213.5 | 233.5 |
| Florida | 136.2 | 150.7 | 163.6 |
| Georgia | 134.9 | 145.9 | 160.0 |
| Hawaii | — | 150.4 | 143.0 |
| Idaho | 129.5 | 132.5 | 137.7 |
| Illinois | 172.1 | 173.3 | 177.6 |
| Indiana | 154.9 | 161.5 | 170.6 |
| Iowa | 149.0 | 150.6 | 158.8 |
| Kansas | 135.2 | 142.3 | 153.4 |
| Kentucky | 138.2 | 150.3 | 169.1 |
| Louisiana | 161.4 | 170.2 | 180.3 |
| Maine | 168.1 | 170.6 | 176.7 |
| Maryland | 173.1 | 181.3 | 193.9 |
| Massachusetts | 178.8 | 172.3 | 179.4 |
| Michigan | 169.6 | 170.9 | 174.0 |
| Minnesota | 152.7 | 151.9 | 152.7 |
| Mississippi | 133.8 | 148.3 | 158.4 |
| Missouri | 154.8 | 159.5 | 168.3 |
| Montana | 143.3 | 146.2 | 151.5 |
| Nebraska | 152.2 | 151.0 | 154.9 |
| Nevada | 141.7 | 155.6 | 163.4 |
| New Hampshire | 173.4 | 175.3 | 179.4 |
| New Jersey | 189.6 | 185.8 | 187.7 |
| New Mexico | 124.9 | 132.8 | 142.9 |
| New York | 186.1 | 183.0 | 182.7 |
| North Carolina | 124.0 | 138.7 | 157.7 |
| North Dakota | 139.4 | 142.7 | 143.0 |
| Ohio | 166.3 | 171.8 | 178.3 |
| Oklahoma | 140.3 | 146.8 | 155.2 |
| Oregon | 143.0 | 146.9 | 155.2 |
| Pennsylvania | 172.2 | 173.9 | 176.9 |
| Rhode Island | 183.2 | 184.3 | 189.4 |
| South Carolina | 132.7 | 144.7 | 161.4 |
| South Dakota | 145.4 | 145.7 | 146.8 |
| Tennessee | 135.9 | 145.7 | 161.3 |
| Texas | 137.8 | 148.7 | 158.4 |
| Utah | 125.0 | 125.0 | 122.0 |
| Vermont | 161.9 | 165.6 | 170.7 |
| Virginia | 142.8 | 156.3 | 171.2 |
| Washington | 152.5 | 153.3 | 160.6 |
| West Virginia | 140.7 | 153.8 | 166.0 |
| Wisconsin | 161.8 | 156.4 | 159.5 |
| Wyoming | 134.0 | 131.2 | 141.9 |
| United States | 158.3 | 162.4 | 169.0 |

*Rate for the population standardized for age on the 1970 U.S. population.

# PREVENTION

## PRIMARY PREVENTION

| | |
|---|---|
| SMOKING | Cigarette smoking is responsible for 85% of lung cancer cases among men and 75% among women — about 83% overall. If the number of smokers was reduced by half, 75,000 lives would be saved each year. Smoking accounts for about 30% of all cancer deaths. |
| NUTRITION | Risk for colon, breast and uterine cancers increases for obese people. High-fat diet may be a factor in the development of certain cancers such as breast, colon and prostate. High-fiber foods may help reduce risk of colon cancer. Foods rich in vitamins A and C may help lower risk for cancers of larynx, esophagus and lung. Eating cruciferous vegetables may help protect against certain cancers. Salt-cured, smoked and nitrite-cured foods have been linked to esophageal and stomach cancer. The heavy use of alcohol, especially when accompanied by cigarette smoking or chewing tobacco, increases risk of cancers of the mouth, larynx, throat, esophagus, and liver. (See below) |
| SUNLIGHT | Almost all of the 400,000 cases of non-melanoma skin cancer developed each year in the U.S. are considered to be sun-related. Recent epidemiological evidence shows that sun exposure is a major factor in the development of melanoma and that the incidence increases for those living near the equator. (See Major Cancer Sites: Skin Cancer) |
| ALCOHOL | Oral cancer and cancers of the larynx, throat, esophagus,and liver occur more frequently among heavy drinkers of alcohol. (See Major Cancer Sites: Oral Cancer). |
| SMOKELESS TOBACCOS | Increased risk factor for cancers of the mouth, larynx, throat, and esophagus. Highly habit forming. (See Major Cancer Sites: Lung Cancer and Oral Cancer) |
| ESTROGEN | For mature women, certain risks associated with estrogen treatment to control menopausal symptoms, including an increased risk of endometrial cancer. However, estrogen can be given safely under careful physician control. (See Major Cancer Sites: Uterine Cancer) |
| RADIATION | Excess exposure to X ray can increase cancer risk. Most medical X rays are adjusted to deliver the lowest dose possible without sacrificing image quality. |
| OCCUPATIONAL HAZARDS | Exposure to a number of industrial agents (nickel, chromate, asbestos, vinyl chloride, etc.) increases risk. Risk factor greatly increased when combined with smoking. |

## SECONDARY PREVENTION

| | |
|---|---|
| COLORECTAL TESTS | The ACS recommends three tests for the early detection of colon and rectum cancer in people without symptoms. The digital rectal examination, performed by a physician during an office visit, should be performed every year after the age of 40; the stool blood test is recommended every year after 50; and the proctosigmoidoscopy examination should be carried out every 3 to 5 years after the age of 50 following two annual exams with negative results. (See Major Cancer Sites: Colon and Rectum Cancer) |
| PAP TEST | For the average risk person, a Pap test is recommended annually until two consecutive satisfactory tests are negative, and then once every three years. The Pap test is highly effective in detecting cancer of the uterine cervix, but is less effective in detecting endometrial cancer. |
| BREAST CANCER DETECTION | The ACS recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine good health habit. Physical examination of the breast should be done every three years from ages 20-40 and then every year. The ACS recommends a mammogram every year for asymptomatic women age 50 and over, and a baseline mammogram between ages 35 and 39. Women 40 to 49 should have mammography every 1-2 years, depending on physical and mammographic findings. |

# COLORECTAL CANCER: EARLY DETECTION IS THE KEY

When cancer of the colon and rectum is found and treated in an early, localized stage, the 5-year survival rate is 87% for colon cancer and 78% for rectal cancer. However, survival figures drop to 47% and 38%, respectively, after the cancer has spread to other parts of the body.

Because colorectal cancer develops over a period of time, detection of the disease is possible long before symptoms appear. Early detection of small cancers and polyps reduces the likelihood of major surgery and the need for a colostomy — an abdominal opening created for the elimination of wastes. In fact, permanent colostomies are rare in cases of colon cancer, and are necessary in only 15% of rectal cancer cases.

Colorectal cancer is second only to lung cancer in terms of incidence. Currently, about 138,000 new cases develop each year; more than 59,900 people die from the disease annually. The incidence of colorectal cancer tends to increase with age, starting at 40 years. More than 94% of all cases occur after the age of 50. Colorectal cancer occurs about equally in both sexes. Anyone with a personal or family history of colorectal cancer, polyps in the colon or inflammatory bowel disease, is at particularly high risk for the disease and should be examined carefully.

Projected 5-year survival rates for colorectal cancer show that early detection saves lives. Currently, the 5-year survival rate is estimated at 45%. With the use of early detection techniques, such as the digital rectal exam, the stool blood test and sigmoidoscopy, the survival rate for patients with colorectal cancer could be increased from 45% to 75%. This means that, over a period of time, 100,000 lives, versus the current 60,000, could be saved each year.

It is recommended that the following procedures, all part of a cancer-related checkup, be performed at designated intervals:

- A digital rectal examination every year after age 40.
- A stool blood test every year after age 50.
- A procto every three to five years after the age of 50, following two annual examinations with negative results.

These guidelines apply only to people without symptoms. Persons with rectal bleeding; gnawing, cramping abdominal pain, or a change in bowel habits should see their doctor immediately.

Evidence suggests that bowel cancer may be linked to the diet. A diet high in fat and/or deficient in fiber content may be a significant causative factor.

# NUTRITION AND CANCER: A COMMON SENSE APPROACH

Extensive research is under way to evaluate and clarify the role diet and nutrition play in the development of cancer. At this point, no direct cause-and-effect relationship has been proved, though statistics show that some foods may increase or decrease the risks for certain types of cancer. Evidence indicates that people might reduce their cancer risk by observing the following recommendations:

### 1. Avoid obesity.

Individuals 40% or more overweight increase their risk of colon, breast, prostate, gallbladder, ovary, and uterine cancers. People with weight problems should consult their physician to determine their best body weight, since their medical condition and body build must be taken into account. Physicians can recommend a suitable diet and exercise regime to help maintain an appropriate weight.

### 2. Cut down on total fat intake.

A diet high in fat may be a factor in the development of certain cancers, particularly breast, colon and prostate. In addition, by avoiding fatty foods, people are better able to control body weight.

### 3. Eat more high fiber foods such as whole grain cereals, fruits and vegetables.

Regular consumption of cereals, fresh fruits and vegetables is recommended. Studies suggest that diets high in fiber may help to reduce the risk of colon cancer. Furthermore, foods high in fiber content are a wholesome substitute for foods high in fat.

### 4. Include foods rich in vitamins A and C in your daily diet.

People should include in their diet dark green and deep yellow fresh vegetables and fruits, such as carrots, spinach, yams, peaches, and apricots as sources of vitamin A; and oranges, grapefruit, strawberries, green and red peppers for vitamin C. These foods may help lower risk for cancers of the larynx, esophagus and the lung. The excess use of vitamin A supplements is not recommended because of possible toxicity.

### 5. Include cruciferous vegetables in your diet.

Certain vegetables in the cruciferous family — cabbage, broccoli, Brussels sprouts, kohlrabi and cauliflower — may help prevent certain cancers from developing. Research is in progress to determine how these foods may protect against cancer. Cruciferous vegetables have flowers with four leaves in the pattern of a cross.

### 6. Eat moderately of salt-cured, smoked and nitrite-cured foods.

In areas of the world where salt-cured and smoked foods are eaten frequently, there is more incidence of cancer of the esophagus and stomach. The American food industry has developed new processes to avoid possible cancer-causing by-products.

### 7. Keep alcohol consumption moderate, if you do drink.

The heavy use of alcohol, especially when accompanied by cigarette smoking or smokeless tobacco, increases risk of cancers of the mouth, larynx, throat, esophagus and liver.

# SMOKING

The American Cancer Society estimates that cigarette smoking is responsible for 85% of lung cancer cases among men and 75% among women — about 83% overall.

The cancer death rate for male cigarette smokers is more than double that of nonsmokers, and the rate for female smokers is 67% higher than for nonsmokers.

The higher cancer rates for men reflect the fact that in the past, more men than women smoked, and smoked more heavily. In recent years, however, the gap between male and female smoking has been narrowing.

Smoking also has been implicated in cancers of the mouth, pharynx, larynx, esophagus, pancreas and bladder. Smoking accounts for about 30% of all cancer deaths, is a major cause of heart disease, and is linked to conditions ranging from colds and gastric ulcers to chronic bronchitis and emphysema.

Smoking is related to 320,000 deaths each year and costs the nation more than $27 billion in medical care.

## A Decline in Smoking

A June 1984 tobacco report of the U.S. Department of Agriculture estimates cigarette output in 1983-84 at 661 billion, down about 2.5% from last year. Consumption during the same period dropped about 3.5%.

From 1976 to 1983, adult male smokers (20 years and older) dropped from 41.9% of the population to 35.2%, while women smokers decreased from 32.0% to 29.1%, according to the National Center for Health Statistics. Overall, the percentage of men and women smokers in the population had dropped to 32.0%. Other recent polls indicate that the proportion of smokers may have dropped to 30%.

Per capita cigarette consumption among adults has fallen — from 4,141 in 1974 to 3,411 in 1984 — reflecting a growing number of ex-smokers. This is the lowest per capita consumption since 1944. From 1965 to 1983, the proportion of adult male ex-smokers (20 years and older) in the total U.S. population increased from 20.5% to 30.3%, while female ex-smokers rose from 8.2% to 15.9%.

A survey supported by the National Institute on Drug Abuse indicated that the percentage of high school seniors (aged 17 and 18) who smoked cigarettes daily decreased by about a quarter, from 28.8% in 1976 to 21.2% in 1983.

It is now estimated — from past national surveys and data from the Cancer Prevention Study II — that there are more than 35 million ex-cigarette smokers in the United States today.

At the same time, however, the average smoker appears to be smoking more heavily. The U.S. Office on Smoking and Health reports that the proportion of adult male smokers (20 years and older) consuming 25 or more cigarettes per day increased from 31.0% to 34.1% between 1976 and 1980, and female smokers from 19.6% to 23.7%.

Figures from the U.S. Department of Agriculture show that a total of 600 billion cigarettes were consumed in 1983, a drop of 5.4% in one year. The Federal excise tax on cigarettes was raised by 8 cents a pack in January 1983. Preliminary figures for 1984 indicate there may be another 1% drop in cigarette consumption in 1984.

## Ways of Quitting

A Federal Trade Commission staff report states that although most Americans are aware of a health risk in smoking, more than 40% don't know smoking causes most lung cancer, and 20% don't know it can cause cancer at all. More than 30% are unaware that smoking doubles a person's risk of heart attack, and 50% of women do not know that smoking during pregnancy increases the risk of stillbirth and miscarriage.

The report prompted the Society to launch an accelerated educational effort to help smokers understand how dangerous smoking is and how specific smoking-related health risks apply to them personally.

## Comprehensive Approach

The Society recommends a comprehensive approach to smoking control at the local level:

1. encouraging young people not to start smoking;
2. educating the public in the hazards of smoking with the aim of getting smokers to quit on their own;
3. providing self-help materials and working with the media;
4. recruiting ex-smoker volunteers to provide one-to-one help for smokers now trying to quit;
5. first encouraging and preparing industries, hospitals and organizations to conduct smoking cessation programs on their own, and then making available FRESHSTART, the new, cost-effective ACS quit-smoking group program; and,
6. supporting legislation to restrict smoking in public places.

## Lower Tar & Nicotine

Research has shown that there is no such thing as a "safe" cigarette, but that those who are not yet able to quit would be well advised to switch to brands with the lowest possible tar and nicotine (T/N) content. Moreover, low T/N smokers find it easier to quit altogether than high T/N smokers.

In an ACS study conducted from 1960 to 1972, the average mortality of low T/N smokers was 16% lower than that of high T/N smokers, and the comparable figure for lung cancer mortality was 26%.

It is important to remember that besides tar and nicotine, cigarette smoke contains a host of other poisonous gases such as hydrogen cyanide, volatile aromatic hydrocarbons, and especially carbon monoxide — possibly a critical factor in coronary heart disease and fetal growth retardation, among other things. While some hazards are reduced slightly by cigarette filters, certain filtered brands have been found to actually deliver more carbon monoxide than those without filters.

### Passive Smoking Hazards

There may even be hazards for non-smokers who breathe the smoke of others' cigarettes. Two scientific studies recently indicated an increased risk of lung cancer among the nonsmoking wives of cigarette smokers. Another study, however, found little if any risk for these "passive smokers."

The question has not been resolved, and there is cause for concern. Therefore, the American Cancer Society believes that further research is urgently needed. The Society's Cancer Prevention Study II, involving more than one million Americans, includes a careful assessment of cancer risk and othe diseases among smokers and passive smokers.

### Industrial Hazards

Industrial workers are especially susceptible to lung diseases due to the combined effects of cigarette smoking and exposure to toxic industrial substances such as fumes from rubber, chlorine and dust from cotton and coal. Exposure to asbestos in combination with cigarette smoking increases an individual's cancer risk nearly 60 times.

In his 1982 report, *The Health Consequences of Smoking*, U.S. Surgeon General C. Everett Koop confirmed many of the ACS findings, declaring that cigarette smoking is "the chief, single, avoidable cause of death in our society, and the most important health issue of our time."

# CANCER CONTROL

## PUBLIC EDUCATION

Because each year thousands of lives could be saved through cancer prevention and early detection, the Society's Public Education programs are designed to inform people about cancer, tell what they can do to protect themselves, and demonstrate related health practices.

The Society believes strongly in the value of periodic, cancer-related checkups and specific cancer tests, as well as prompt action in the event that one of cancer's seven warning signals occurs.

Six cancer sites offer the greatest opportunity for prevention or cure: lung, colorectal, breast, uterine, oral and skin. Cancers at these sites account for the majority of cancer cases and about half of all cancer deaths.

### P-A-C-E Strategy

The Society's P-A-C-E (Priority Activities in Cancer Education) planning strategy focuses on the first four of these six sites — where prevention or early detection provides the biggest payoff in lives saved.

ACS Public Education programs are divided into two major audience categories: adults and youth. Adults are reached through the workplace, clubs and organizations, home and neighborhood, and through programs with other health agencies. Youth programs are organized according to school grade: kindergarten through 6th; 7th through 9th; and 10th through 12th. These programs teach young people good health habits, help them make healthful lifestyle decisions and understand health behavior as it relates to cancer.

Programs for adults are carried out in small group setings or on a one-to-one basis, involving two-way communication and interaction. Whenever possible, volunteers are selected on the basis of skills that can be readily adapted to Society work, such as ex-smokers with group experience who help in smoking cessation programs, and nurses who can teach breast self-examination to groups of women. The Society reinforces its Public Education messages with a variety of films, filmstrips, pamphlets and posters.

### Reaching More People

This year, local ACS Public Education programs involving two-way communication are expected to have reached 15 million adults and over 30 million young people.

For the rest of the decade, the Society has set specific behavioral goals of persuading more Americans to have tests for colorectal cancer, reducing the number of smokers, and increasing the number of women who practice monthly breast self-examination, get Pap tests and have endometrial tissue samples taken.

In 1985, the Society is expanding a three-year special project — Colorectal Health Check — to reach more Americans with Public Education programs on colon and rectum cancer.

In addition to the Society's intensive, person-to-person educational outreach, broader ACS programs blanket the nation with lifesaving messages. During the annual Cancer Crusade, volunteers make personal home visits, urging individuals to protect themselves against cancer.

More than 60 million educational leaflets are distributed each year, and important cancer educational messages reach nearly every U.S. household through television, radio and the print media.

### Cancer-Related Checkup Guidelines

Guidelines for the early detection of cancer in people without symptoms are recommended by the American Cancer Society as follows: A cancer-related checkup:

- every 3 years for those 20-40 years of age.
- every year for those 40 and over.

The Society advises: "Talk with your doctor — ask how

the guidelines relate to you." The checkup should always include health counseling (such as tips on quitting smoking) and examinations for cancer of the thyroid, testes, prostate, mouth, ovaries, skin and lymph nodes.

*In particular:*

- Ages 20-40 — For breast cancer, an examination by a physician every three years, a self-exam every month, and one baseline breast X ray between the ages of 35 and 39. For uterine cancer, a pelvic exam every three years and a Pap test at least every three years after two initial negative tests one year apart (including women under 20 if sexually active.)
- Ages 40 and over — For breast cancer, an exam by a doctor every year, a self-exam every month and a breast X ray every 1-2 years for those 40-49; every year for those 50 and over. For uterine cancer, a pelvic exam every year, a Pap test at least every three years (after two negative tests a year apart), and an endometrial tissue sample at menopause, if at risk. For colon and rectum cancer, a digital rectal exam every year after 40, and a stool blood test every year after 50 as well as a procto exam every 3-5 years after two initial negative tests one year apart.

Some people are at higher risk for certain cancers and may need to have tests more frequently. See "Major Cancer Sites" for high risk factors.

# PROFESSIONAL EDUCATION

ACS Professional Education programs bring the latest developments in cancer to the medical community: members and students of the medical, dental, nursing and allied health professions.

Professional Education's National conferences, clinical fellowships, materials, professorships and scholarships provide information and training in the prevention and early detection of cancer, and in the treatment and rehabilitation of cancer patients. Its involvement in such Division and Unit programs as the Colorectal Health Check and the Great American Smokeout, are part of the overall ACS Professional Education effort.

## Audiovisuals, Journals

Videotapes, films, slide sets, audiotapes, publications and exhibits are also available for Professional Education programs in hospitals as well as in medical, dental and nursing schools, and are used by professional societies at local and national meetings.

The ACS publishes *Ca-A Cancer Journal for Clinicians,* which is directed particularly to the primary care physician and has a total circulation of more than 470,000. The Society supports the publication of *Cancer,* directed to those specializing in the care of the cancer patient.

The Society maintains a library of Professional Education motion pictures, videocassettes and slide sets. All are distributed through ACS Divisions and Units on a free loan, five-year lease or direct sale basis.

## Nursing Programs

*Cancer Nursing News,* a newsletter sent to about 80,000 nurses, began publication in 1982. The newsletter keeps nurses up to date on cancer, oncology nursing, the American Cancer Society, and opportunities in continuing education. The newsletter is sent free to any nurse who desires it. Requests for subscriptions should be sent to the Executive Editor, *Cancer Nursing News,* c/o American Cancer Society, 4 West 35th St., New York, NY 10001.

In 1981 the Society initiated a program of nursing scholarships. Twenty one-year scholarships are awarded each year to qualified graduate students studying for a master's degree with a specialty in cancer nursing. The recipients may apply for a second year's funding.

Another recently launched program, "Clinical Professorships in Oncology Nursing," provides a means for ACS Divisions to support selected individuals who will develop high quality cancer teaching programs within schools of nursing.

## Clinical Oncology Awards

Since 1948, the ACS National Clinical Fellowship program has spent more than $40 million to train some 7,400 physicians and dentists in the diagnosis and treatment of cancer. Training has been provided on two levels at centers and hospitals with qualified training programs.

The Regular Clinical Fellowship program — for hospital residents — is designed to improve the management of the patient with cancer by supporting clinical oncology training for young physicians and dentists.

The Junior Faculty Clinical Fellowship program — for postresident physicians and dentists — is intended to strengthen cancer teaching programs by supporting outstanding young clinicians in academic careers.

During 1984-85, training will be supported for 367 Regular Clinical Fellows and 150 Junior Faculty Clinical Fellows.

The Clinical Fellowship program has been extremely successful in achieving its goal of increasing the number of highly qualified oncologists providing cancer care. In the future, the emphasis of the program will be on developing *academic* oncologists who will acquire both clinical oncology expertise and the ability to perform independent clinical oncology research.

Beginning in 1985, the Society will award Clinical Oncology Career Development Awards to some outstanding individuals who have demonstrated a commitment to pursue an academic career in oncology.

## Unproven Methods of Cancer Management

The American Cancer Society maintains information on unproven methods of cancer management. This information is reviewed in-depth and issued as position statements. These statements are available on request to physicians, science writers, editors and the general public, to assist in evaluating claims made for unproven methods of cancer prevention, detection, diagnosis and treatment.

The Society welcomes new developments which have been proven scientifically effective and safe in the prevention, detection, diagnosis or treatment of cancer.

# SERVICE & REHABILITATION

In 1984, nearly one half million cancer patients have been reached through the innovative service and rehabilitation programs of the American Cancer Society. Because of the many volunteers at the Division and Unit levels, the Society is able to offer a wide range of services encompassing:

1. Information and guidance directing patients to Society services, community resources and specific information about cancer;
2. Home care items for use by patients;
3. Transportation of cancer patients, assisting them in getting to and from medical and therapy appointments;
4. Rehabilitation programs helping patients return to their families, communities and occupations through carefully trained and selected visitor and group programs;
5. Patient/family education programs to provide a better understanding of the disease and its management through group education programs, pamphlets, booklets and audiovisual presentations.

*Information and Guidance* services provide specific information about cancer as well as referral to Society services and other resources in the community to meet the social, psychological and home care needs of cancer patients and their families.

## Rehabilitation Programs

*Patient Visitor Program (CanSurmount)* is a short-term visitor program for patients, and the families of patients, with all types of cancer. Hospital and home visits are made with the approval and awareness of the physician. The one-to-one visit by a person who has experienced the same type of cancer offers functional, emotional and social support.

*Reach to Recovery* is the largest of the Society's patient visitor programs. It addresses the many needs of women with breast cancer. Women volunteers, who have successfully adjusted to their treatment for breast cancer, are available to visit new patients with the approval of the attending physician. A visit from a Reach to Recovery volunteer demonstrates that a woman treated for breast cancer can return to an active, normal life. The program provides information, as appropriate, on prostheses, breast reconstruction and new options on breast cancer management. In addition, literature and services to help husbands, children and friends of breast cancer patients are available.

*Laryngectomy Rehabilitation Program*, spearheaded by The International Association of Laryngectomees (IAL), brings the message that a laryngectomee can return to a normal life. Coordinated through more than 325 clubs, laryngectomee visitors, who themselves have had their larynxes (voice boxes) removed because of cancer, provide pre- and/or post-operative support to patients who have recently undergone the laryngectomy operation.

*Ostomy Rehabilitation Program* — Some patients with intestinal or urinary cancers must have abdominal ostomies (surgically constructed openings for elimination of wastes). Trained volunteers who have experienced this same type of surgery offer help on a one-to-one basis. Cooperating with the United Ostomy Association and enterostomal therapists, patients are assisted in their physical and psychological adjustment.

## Patient and Family Education

The Society sponsors group and individual education programs, distributes pamphlets and booklets for an individual's use, and provides audiovisual presentations. Group programs such as *I CAN COPE* provide information on cancer therapy, treatment, side effects, nutrition, resource availability and other topics of interest to cancer patients and family. The Society is continuing its expansion of patient education services by providing a broader variety of pamphlets, books and audiovisual aids for adult and children patients and their families to help them understand, and deal with the complexities of the disease.

## Other Programs

*Home Care Items* — A program providing necessary and useful home care items, supplies, equipment, dressings and gifts for the comfort and recreation of the patient.

*Transportation* — Through the efforts of volunteer drivers in programs such as Road to Recovery, cancer patients receive transportation for diagnosis, treatment, rehabilitation and continuing care.

# COSTS OF CANCER

A study by the National Center for Health Statistics (NCHS) puts overall medical costs for cancer at $10.8 billion for 1980. Because medical care costs have been inflating at 20% or more a year, that figure could easily have doubled by now.

In the NCHS study, 67% of the total amount was spent for hospital care, 23% for physicians' services, 5% for drugs, 4% for nursing home care, and 1% for other professional services.

Individual costs vary considerably, depending on the location of the cancer, possible recurrences and the extent of follow-up care. Daily hospital fees alone can run $250 or more a day, and each course of therapy can amount to several thousand dollars.

A study by the Blue Cross and Blue Shield Association estimates that the average American who died of cancer in 1983 ran up more than $22,000 in medical bills during the final year of life. The study, based on cases in Michi-

gan, Indiana and Georgia, was funded by the U.S. Health and Human Services Department.

Individuals have several sources of help in paying for cancer costs: third-party payers such as Blue Cross and private insurance companies, public agencies and private health organizations. Cancer is covered by personal insurance plans either under narrowly defined cancer policies or through catastrophic illness provisions in comprehensive insurance programs.

The Third National Cancer Survey showed that for patients under 65 years, Blue Cross and private insurers were the source of payment in over 77% of the cases. For patients over 65, Medicare paid expenses in nearly 88% of the cases.

Hospital costs can be reduced substantially through the use of nursing facilities, hospices for advanced cancer patients, and home care with periodic professional medical visits.

## 30-YEAR TRENDS IN AGE-ADJUSTED CANCER DEATH RATES PER 100,000 POPULATION 1949-51 to 1979-81

| SEX | SITES | 1949-51 | 1979-81 | PERCENT CHANGES | COMMENTS |
|---|---|---|---|---|---|
| Male | All Sites | 168.0 | 217.0 | + 29 | Steady increase mainly due to lung cancer. |
| Female | All Sites | 147.8 | 135.5 | − 8 | Slight decrease. |
| Male | Bladder | 7.2 | 6.6 | * | Slight fluctuations; overall no change. |
| Female | Bladder | 3.2 | 1.9 | − 41 | Some fluctuations; noticeable decrease. |
| Male | Breast | 0.4 | 0.2 | * | Constant rate. |
| Female | Breast | 25.9 | 26.3 | + 2 | Slight fluctuations; overall no change. |
| Male | Colon & Rectum | 26.2 | 25.4 | * | Slight fluctuations; overall no change. |
| Female | Colon & Rectum | 25.3 | 18.5 | − 27 | Slight fluctuations; noticeable decrease. |
| Male | Esophagus | 4.7 | 5.5 | + 17 | Some fluctuations; slight increase. |
| Female | Esophagus | 1.2 | 1.5 | * | Slight fluctuations; overall no change in female. |
| Male | Kidney | 3.3 | 4.7 | + 42 | Steady slight increase. |
| Female | Kidney | 2.0 | 2.1 | * | Slight fluctuations; overall no change. |
| Male | Leukemia | 7.3 | 8.7 | + 19 | Early increase, later leveling off and decrease. |
| Female | Leukemia | 5.0 | 5.1 | * | Slight early increase, later leveling off. |
| Male | Liver | 6.9 | 4.8 | − 30 | Some fluctuations. Steady decrease in both sexes. |
| Female | Liver | 8.0 | 3.5 | − 56 | |
| Male | Lung | 22.0 | 71.2 | + 224 | Steady increase in both sexes due to cigarette smoking. |
| Female | Lung | 4.8 | 20.7 | + 331 | |
| Male | Oral | 6.4 | 5.6 | * | Slight fluctuations; overall no change in both sexes. |
| Female | Oral | 1.6 | 1.9 | * | |
| Female | Ovary | 7.9 | 8.0 | + 1 | Steady increase, later leveling off and decrease. |
| Male | Pancreas | 8.2 | 10.6 | + 29 | Steady increase in both sexes, then leveling off. Reasons unknown. |
| Female | Pancreas | 5.5 | 7.0 | + 27 | |
| Male | Prostate | 20.8 | 22.7 | + 9 | Fluctuations throughout; overall slight increase. |
| Male | Skin | 3.3 | 3.5 | * | Slight fluctuations; overall no change in both sexes. |
| Female | Skin | 2.1 | 1.8 | * | |
| Male | Stomach | 24.6 | 8.3 | − 66 | Steady decrease in both sexes; reasons unknown. |
| Female | Stomach | 13.5 | 3.9 | − 71 | |
| Female | Uterus | 21.6 | 7.8 | − 64 | Steady decrease. |

*Percent changes not listed because they are not meaningful.

# RESEARCH

## THE ACS AND RESEARCH

The American Cancer Society is one of the largest sources of cancer research funds in the United States, second only to the National Cancer Institute, an agency of the Federal government.

The Society's overall investment in research each year has grown steadily from $1 million in 1946 to more than $64 million* today. This sum represents nearly a third of the total ACS budget. To date, the Society has invested more than half a billion dollars in cancer research.

The research program focuses primarily on investigator initiated projects, rather than directed research undertaken on a contract basis. With the exception of staff and facilities to carry out its epidemiological studies, the ACS neither hires staff researchers nor operates its own laboratories. This gives the Society the freedom to place its grants where innovative and promising ideas are being explored.

A key factor in the role of the Society in cancer research is providing qualified scientists with alternative funding sources to carry on their work. The Society believes it can make the most effective use of its research funds by supporting scientists working in established medical institutions across the country. In this way there is a minimum of overhead and a maximum of flexibility to make sure that research money has the highest probability of yielding results that will benefit people.

Applications for ACS grants are put through a rigorous process of evaluation, beginning with careful study by the appropriate one of 11 scientific review committees and two additional groups of experts. It must be given final approval by the National Board of Directors.

### Kinds of Grants

The Society's research program is diverse in concept and recipients. It provides support both for established scientists and those starting out on their own independent research. It funds postdoctoral training for promising young investigators and stimulates new ideas in cancer research among those working in universities, institutes and teaching hospitals.

Overall, the program offers five types of grants: (1) Research and Clinical Investigation Grants to finance investigator-initiated research; (2) Institutional Research Grants to universities, institutes and hospitals to support pilot studies and the work of young investigators in cancer; (3) Research Personnel Grants to outstanding scientists and students specializing or planning to specialize in cancer research; (4) Research Development Programs to provide rapid funding for priority projects; and (5) Special Institutional Grants for Cancer Cause and Prevention Research to provide longer term funding.

*Research Professorships.* The Research Professorship grant program, unique in the field, has been in existence since 1957. The Society supports 23 of the nation's most gifted scientists through retirement. These are people devoting their life's work to cancer research. Freed of major administrative responsibilities and other restrictions, they can concentrate on their fields of scientific investigation.

*Physicians' Training Fellowships.* Unique in the research world, this type of Research Personnel Grant was inaugurated in 1981 because of a dearth of MD's in the research field. It provides an opportunity for physicians to take two years from their medical careers to train as researchers.

*Research Development Program.* Established to identify and provide rapid funding for high priority projects, approved applications can be funded in less than three months. This compares with the 10 to 18 months required by the Federal government before a new application can be funded.

The kinds of research project eligible under the Research Development Program include: (1) unique research opportunities which cannot wait for the normal lengthy funding procedures; (2) unanticipated needs relating to research already under way; (3) program coordination, especially that involving clinical trials and the dissemination of research results to community hospitals; and (4) program integration between the American Cancer Society and other health organizations.

All applications are evaluated for — among other considerations — merit, qualifications and productivity of the investigator; relevance, need for rapid funding, and probability of the project's eventual contribution to cancer control. More than $10 million has been appropriated so far to the Research Development Program, over half of which has been for interferon research.

*Interferon Research.* Interferon, a natural body protein, was discovered as an antiviral agent and later found to have some anticancer activity. In 1978, the Society invested an unprecedented $2 million to purchase interferon for clinical trials. The substance was extremely scarce and expensive, since it was obtained from human blood cells.

The first tests were performed on carefully selected patients in 15 U.S. institutions, and included 175 patients. Four types of cancer were in the study — multiple myeloma, melanoma, breast cancer and non-Hodgkin's lymphoma. Additional studies involving melanoma, advanced kidney cancer and nasopharyngeal cancer are being conducted at five institutions.

So far, a number of patients have shown some response to interferon, ranging from those whose steady downhill course was stabilized, to those whose tumors disappeared entirely. It is still too early to tell what the long-term effects will be.

In working with interferon, scientists discovered that there are at least three different types, each produced by different cells, and potentially capable of different activity. In addition, large quantities of interferon now can be produced using the techniques of recombinant DNA. It is far cheaper and purer than the original human blood substance.

*Subject to audit

In early 1980 the Society allocated an additional $4.8 million for interferon research which in part permitted a study to be conducted using a different type of interferon, one produced by fibroblast cultures. This interferon is being studied at 12 institutions in advanced prostate cancer, glioblastoma multiforme and soft tissue sarcomas.

Besides the American Cancer Society, sponsors of interferon research in this country include the National Cancer Institute and the National Institute of Allergy and Infectious Diseases.

Ultimately, interferon may be valued not so much for itself, as for its role in heralding a whole new class of compounds called "biologic response modifiers," which will fight cancer by stimulating the body's immune system.

### ACS Research in the 80's

In addition to ongoing interferon studies, ACS-funded researchers will continue to investigate broad areas of cancer research in the coming decade. For example, they will be exploring:

*Genetic engineering.* One method in this new technology, recombinant DNA (gene splicing) is already being used to produce interferon. It has among its potential uses the manufacture of powerful new drugs, correcting impaired immune systems, even modifying heredity by transplanting foreign genes. It is hoped that the process will yield other anticancer activities.

*Man-made antibodies* such as hybridomas (antibody factories) and highly specific monoclonal antibodies can be produced that will recognize cancer cells only, and thus be able to detect cancer early, when the disease is most curable, before clinical signs appear. Monoclonal antibodies already have been used to deliver drugs directly to tumors, killing them but sparing healthy issue,i.e., a rifle instead of a shotgun.

*Mechanisms of carcinogenesis.* Investigators are approaching these key questions from many angles. One model, as found in animals, shows that cancer in humans develops in a two-step process — initiation and promotion. Other questions include: Are there proto-oncogenes, normal genes, serving as master switches for early tissue development, which induce normal cells to become cancerous later in life? If so, what turns them on? Can they be programmed to stay off? Do viruses, already known to cause cancer in animals, also cause cancer in humans, perhaps by activation of these proto-oncogenes?

*Chemoprevention.* People can be protected from cancer by what they eat or drink, or by other substances or lifestyles that serve as defense mechanisms. Clues are being pursued by ACS researchers studying such agents as vitamin A; retinoids (synthetic forms of vitamin A); vitamin C; vitamin E; the chemical element selenium, found in the soil; and by other naturally occurring substances in brussels sprouts, cabbage, etc.

Still other ACS investigators are looking for ways to detect cancer earlier by tracing a cell's biochemical markers. They are exploring evidence that the outbreak of the rare skin cancer, Kaposi's sarcoma, is linked to a breakdown in the individual's immune system. And they are testing the hypothesis that certain chemicals enhance a tumor's receptivity to radiation therapy.

### The Financial Research Picture

In fiscal 1984, the ACS made 674 grants to major institutions in this country and to scientists working here and abroad. The total amount, subject to audit, was nearly $58 million. This does not include some $2.5 million granted directly by ACS Divisions. The following table — covering the years 1981 to 1984 inclusive — lists the number of applications received, the total number of dollars required, and those actually funded by the ACS National Office. ACS allocated its funds to effectively carry out its three-pronged attack against cancer: Research, Education and Service.

| | Requested | | Funded | |
|---|---|---|---|---|
| Year | Number | Amount | Number | Amount |
| 1981 | 2,069 | 230,936,242 | 672 | 51,960,530 |
| 1982 | 2,475 | 300,961,755 | 681 | 53,953,831 |
| 1983 | 2,564 | 336,760,146 | 646 | 54,132,563 |
| 1984 | 2,247 | 290,368,552 | 674 | 57,775,330 |

## CANCER AND THE ENVIRONMENT

Most cancer cases in the United States are believed to be environmentally related, that is, associated in some way with our physical surroundings, personal habits or lifestyles.

Occupational hazards, although associated with only a small percentage of cancers, are under close surveillance. Virtually every suspected major chemical and other substance in the workplace presumed to be a health risk is under investigation. Each study can require years and hundreds of thousands of dollars to complete.

Some environmental causes of cancer are well known. About 30% of all cancers are directly related to the use of tobacco, either alone or in conjunction with excessive consumption of alcohol.

Other causes are harder to determine. Diet is suspected as an important element in cancer risk, some say as much as 35% of all cancer deaths. There is much research underway on the role diet and nutritution play in the development of cancer.

To help identify environmental factors in human cancer, the American Cancer Society has undertaken a three-part program of environmental cancer research. This involves (1) Cancer Prevention Study II, a new epidemiologic study to examine the relationship of environment and lifestyle to cancer development; (2) studies of groups exposed to industrial substances suspected of causing cancer; and (3) support of extramural cancer cause and prevention research projects.

## The American Cancer Society's Cancer Prevention Study II

One of the largest research studies ever carried out in the United States was launched in 1982. Cancer Prevention Study II, a long-term prospective study, is examining the habits and exposures of more than one million Americans to learn how lifestyles and environmental factors affect the development of cancer.

Modeled after the first ACS Cancer Prevention Study (1959-72), CPS-II is similar in method but wider in scope and involves more participants.

Over 77,000 volunteers were mobilized to enroll 1.2 million men and women in the study. These volunteer researchers distributed a four-page confidential questionnaire to participants, who were asked about their exposures to certain environmental conditions, their history of disease and their lifestyle. The questionnaires were designed to elicit more than 500 pieces of information each, information which is computerized for statistical analysis.

Many of the questions focus on health issues of current concern. These include risks of certain drugs, foods and various occupational exposures; low-tar and nicotine cigarettes; consumer products; long-term exposure to low-level radiation; and the health effects associated with air and water pollution.

For a period of six years, and possibly longer, the volunteers will keep track of the status and whereabouts of study participants. The first follow-up started in September 1984. Follow-ups are also scheduled for 1986 and 1988. Various suspected relationships will be tested by comparing mortality rates of differently exposed groups.

The goal of the study is to identify those factors that increase a person's chances of developing cancer, those that carry little or no risk, and those that actually may help prevent cancer. With this information, the Society will be able to promote more effective educational programs in cancer prevention.

The Society's first Cancer Prevention Study resulted in important findings about health and disease. Study data provided overwhelming evidence that cigarette smoking is the major cause of lung cancer and an important factor in other cancers. It also furnished information on risks of heart disease and other serious illnesses, and revealed a relationship between obesity and certain cancers.

Since the first study, new factors in our environment have been identified that may be related to cancer. The Society decided to initiate a second study to respond to the concerns of the public and scientific community about suspected carcinogens.

Without the use of ACS volunteers, the cost of carrying out CPS II would total more than $100 million. With volunteers to collect the data, the study is estimated to cost only about $9 million to complete.

## Studies of Occupational Groups

A number of studies of union workers exposed to various agents have been undertaken in the Society's Intramural Research Program; the findings will have considerable public health implications.

It has been established that asbestos workers have a high risk of lung cancer, gastrointestinal cancer and other conditions. Less clear, though, is the hazard asbestos exposure poses for the general population, particularly among people exposed to very low levels.

The ACS is studying the mortality of family members of asbestos factory workers and insulation workers to determine if they are at an increased risk of lung cancer and other asbestos-related diseases. A study of shipyard workers will offer data on this group's cancer incidence and mortality rates.

In a current study, it may be learned how smoking cessation affects the lung cancer risk of insulation workers who no longer work with asbestos materials.

Other occupational groups under continuing investigation include vinyl chloride workers, painters, rubber plant employees, those who work with polychlorinated biphenyls (PCB's), printing press workers, and health care and hospital employees.

## Special Institutional Grants

As part of its continuing program to provide substantial and relatively long-term support for major institutions engaged in cancer cause and prevention research, the American Cancer Society awarded continuing grants to the following institutions in 1984:

- Institute of Environmental Medicine, New York University Medical Center, New York, N.Y. (Dr. Arthur C. Upton), to conduct a broad spectrum of studies dealing with such subjects as DNA interactions, risk assessment and nutrition.
- Massachusetts Institute of Technology, Boston, Mass. (Dr. Gerald N. Wogan), to use innovative techniques to detect changes in DNA, hemoglobin and albumin, and changes in T-cells that could signal relatively low exposures to carcinogens; together with the Harvard School of Public Health (Dr. Brian MacMahon) for biochemical studies of cancer risks, involving such groups as smokers, nonsmokers and those with particular dietary habits.
- Milton Hershey Medical Center, Pennsylvania State University, Hershey, Pa. (Dr. Fred Rapp), to research the cause, course and prevention of metastatic tumor growth.
- The American Health Foundation, New York, N.Y., to conduct epidemiologic studies, health behavior evaluations, and biochemical analyses of various consumer products.
- Temple University School of Medicine, Philadelphia, Pa., for an ongoing study of cancer prevention and analyses of chemical and environmental carcinogens.
- Memorial Sloan-Kettering Cancer Center, New York, N.Y., to identify candidates at high risk of colorectal cancer.
- University of Minnesota, Minneapolis, for a study of inhibitors of carcinogenesis found in diet.
- Mount Sinai School of Medicine, New York, N.Y., for collecting and disseminating information on reported environmental carcinogens.
- The Johns Hopkins University School of Medicine, Baltimore, Md., to develop new methods of protecting against cancer-causing influences, with special emphasis on the hazards of medical drugs.
- The University of Southern California School of Medicine, Los Angeles, to study the possible relationship of cancer to specific occupational, drug or other environmental exposures.

# SUMMARY OF RESEARCH GRANTS & FELLOWSHIPS AWARDED BY ACS (National Society & Divisions) DURING THE FISCAL YEAR ENDED AUGUST 31, 1984 (Subject to Audit)

| | | |
|---|---|---|
| Alabama, Univ. of, Birmingham | (4) | 218,062.00 |
| Albany Medical Coll. of Union Univ., Albany, NY | (1) | 49,786.00 |
| Amer. Type Culture Collection, Rockville, MD | (1) | 14,062.00 |
| Arizona State Univ., Tempe | (1) | 45,000.00 |
| Arizona Univ., Tucson | (1) | 22,277.00 |
| Arkansas, Univ. of, Fayetteville | (1) | 191,086.00 |
| Baylor Coll. of Medicine, Houston, TX | (4) | 252,786.00 |
| Beth Israel Hosp., Boston, MA | (2) | 146,750.00 |
| Boston Univ., Boston MA | (4) | 450,000.00 |
| Brandeis Univ., Waltham, MA | (3) | 205,000.00 |
| Brown Univ., Providence, RI | (6) | 528,857.00 |
| California Inst. of Tech., Pasadena, CA | (3) | 170,078.00 |
| California, Univ. of (various locations) | (70) | 5,665,218.00 |
| Carnegie Inst. of Washington, Baltimore, MD | (5) | 322,250.00 |
| Case Western Reserve Univ., Cleveland, OH | (6) | 455,670.00 |
| Chicago, Univ. of, IL | (12) | 1,297,431.00 |
| Children's Cancer Res. Fdn., Boston, MA | (2) | 119,825.00 |
| Children's Hosp. of Philadelphia, PA | (3) | 56,241.00 |
| Children's Hosp. Medical Ctr. of Northern Calif., Oakland | (1) | 90,000.00 |
| Children's Hosp. Soc., Los Angeles, CA | (2) | 276,266.00 |
| Cincinnati, Univ. of, OH | (3) | 219,505.00 |
| Clark Univ., Worcester, MA | (1) | 42,000.00 |
| Cold Spring Harbor Lab, NY | (3) | 290,000.00 |
| Coll. of Medicine and Dentistry of New Jersey | (2) | 180,987.00 |
| Colorado State Univ., Fort Collins | (1) | 214,571.00 |
| Colorado, Univ. of, Boulder | (10) | 679,606.00 |
| Columbia Univ., New York, NY | (8) | 792,808.00 |
| Connecticut, Univ. of, Storrs | (2) | 126,135.00 |
| Cornell Univ., Ithaca, NY | (1) | 149,101.00 |
| Cornell Univ., New York, NY | (2) | 121,690.00 |
| Dartmouth Coll., Hanover, NH | (4) | 251,054.00 |
| Delaware, Univ. of, Newark | (1) | 95,047.00 |
| Duke Univ., Durham, NC | (7) | 920,448.00 |
| Emory Univ., Atlanta, GA | (2) | 215,000.00 |
| Florida, Univ. of, Gainesville | (2) | 62,353.00 |
| Fred Hutchinson Cancer Res. Ctr., Seattle, WA | (1) | 89,000.00 |
| Hahnemann Medical Coll., Philadelphia, PA | (2) | 139,376.00 |
| Harvard Sch. of Pub. Health, Boston, MA | (2) | 330,000.00 |
| Harvard Univ., Boston, MA | (17) | 980,019.00 |
| Hawaii, Univ. of, Honolulu | (3) | 112,482.00 |
| Hospital for Joint Diseases, New York, NY | (1) | 125,000.00 |
| Hunter Coll. Organized Res., New York, NY | (1) | 28,605.00 |
| Illinois, Univ. of, Urbana | (4) | 245,934.00 |
| Indiana, Univ. of, Bloomington | (3) | 296,240.00 |
| Inst. for Cancer Res., Philadelphia, PA | (3) | 270,325.00 |
| Iowa, State Univ., of, Iowa City | (4) | 430,778.00 |
| Jackson Laboratory, Bar Harbor, ME | (2) | 207,750.00 |
| Jefferson Medical Coll., Philadelphia, PA | (1) | 146,180.00 |
| Jewish Hosp. of St. Louis, MO | (1) | 170,563.00 |
| Johns Hopkins Univ., Baltimore, MD | (18) | 1,603,084.00 |
| Kansas State Univ., Manhattan | (1) | 110,000.00 |
| Kansas, Univ. of, Lawrence | (4) | 495,720.00 |
| Kentucky, Univ. of, Lexington | (2) | 148,046.00 |
| La Jolla Cancer Res. Fdn., La Jolla, CA | (1) | 48,488.00 |
| Lankenau Hosp., Philadelphia, PA | (1) | 120,000.00 |
| Linus Pauling Inst. of Science and Medicine, Palo Alto, CA | (1) | 136,772.00 |
| Long Island Coll. Hosp., Brooklyn, NY | (1) | 94,600.00 |
| Louisiana State Univ., Baton Rouge | (1) | 20,000.00 |
| Louisville, Univ. of, Louisville, KY | (2) | 115,000.00 |
| Maryland, Univ. of, Baltimore | (7) | 739,804.00 |
| Massachusetts General Hosp., Boston | (5) | 880,775.00 |
| Massachusetts Inst. of Technology, Cambridge | (12) | 798,044.00 |
| Massachusetts, Univ. of, Amherst | (3) | 300,945.00 |
| Miami, Univ. of, Coral Gables, FL | (2) | 316,325.00 |
| Michigan Molecular Inst., Midland | (1) | 127,250.00 |
| Michigan, Univ. of, Ann Arbor | (8) | 1,009,396.00 |
| Minnesota, Univ. of, Minneapolis | (8) | 693,219.00 |
| Missouri, Univ. of, Columbia | (1) | 147,159.00 |
| Montefiore Hosp., New York, NY | (1) | 166,890.00 |
| Mount Sinai Sch. of Medicine, New York, NY | (9) | 1,017,495.00 |
| Nat'l Acad. of Sciences, Washington, DC | (1) | 34,000.00 |
| Nat'l Cancer Inst., Bethesda, MD | (2) | 48,280.00 |
| Nat'l Inst. of Child Health and Human Development, Bethesda, MD | (1) | 32,520.00 |
| Nat'l Inst. of Dental Res., Bethesda, MD | (1) | 32,079.00 |
| Nat'l Jewish Hosp. and Res. Ctr., CO | (4) | 453,896.00 |
| Nat'l Soc. for Medical Res., Washington, DC | (1) | 10,000.00 |
| NCI-Biology Laboratory of Viruses | (1) | 32,060.00 |
| NCI-Laboratory of Cell Biology | (1) | 32,120.00 |
| New England Medical Ctr. Hosp., Boston, MA | (3) | 315,491.00 |
| New England Regional Primate Res. Ctr., Southborough, MA | (1) | 200,000.00 |
| New Mexico, Univ. of, Albuquerque | (2) | 133,339.00 |
| New York State Dept. of Health, Albany | (1) | 32,000.00 |
| New York State Psychiatric Inst. | (1) | 10,000.00 |
| New York Univ., New York, NY | (5) | 354,440.00 |
| North Carolina, Univ. of, Chapel Hill | (9) | 650,955.00 |
| Northwestern Univ., Chicago, IL | (4) | 221,000.00 |
| Oak Ridge Assoc. Univs. Inc., Oak Ridge, TN | (1) | 86,331.00 |
| Ohio State Univ., Columbus | (3) | 213,978.00 |
| Oregon State College, Corvallis | (3) | 149,863.00 |
| Oregon, Univ. of, Eugene | (4) | 296,580.00 |
| Pennsylvania Hospital, Philadelphia | (1) | 17,125.00 |
| Pennsylvania State, Univ., University Park | (5) | 189,140.00 |
| Pennsylvania, Univ. of, Philadelphia | (7) | 563,665.00 |
| Peter Bent Brigham Hosp., Boston, MA | (2) | 215,109.00 |
| Pittsburgh, Univ. of, Pittsburgh, PA | (6) | 473,013.00 |
| Princeton Univ., Princeton, NJ | (3) | 240,000.00 |
| Pub. Health Res. Inst., New York, NY | (1) | 84,932.00 |
| Purdue Univ., Lafayette, IN | (5) | 337,237.00 |
| Reed College, Portland, OR | (1) | 120,000.00 |
| Rochester, Univ. of, Rochester, NY | (5) | 528,000.00 |
| Rockefeller Univ., New York, NY | (9) | 591,886.00 |
| Roger Williams General Hosp., Providence, RI | (1) | 58,673.00 |
| Roswell Park Memorial Inst., Buffalo, NY | (13) | 1,595,768.00 |
| Salk Inst. for Biological Studies, San Diego, CA | (3) | 133,875.00 |
| Scripps Clinic Res. Fdn., La Jolla, CA | (5) | 324,059.00 |
| Sidney Farber Cancer Ctr., Boston, MA | (14) | 1,119,631.00 |
| Sloan-Kettering Inst. for Cancer Res., New York, NY | (23) | 2,769,229.00 |
| Sloan-Kettering Inst., Westchester, NY | (1) | 68,901.00 |
| South Carolina, Univ. of, Columbia | (4) | 413,139.00 |
| Southern California, Univ. of, Los Angeles | (5) | 385,365.00 |
| Southern Res. Inst., Birmingham, AL | (2) | 199,779.00 |
| St. Jude Children's Res. Hosp., Memphis, TN | (3) | 175,730.00 |
| St. Louis Univ., St. Louis, MO | (3) | 226,216.00 |
| Stanford Univ., Stanford, CA | (16) | 1,192,875.00 |
| State Univ. of New York, Albany, NY | (1) | 55,730.00 |
| State Univ. of New York, Brooklyn, NY | (2) | 235,444.00 |
| State Univ. of New York, Buffalo, NY | (3) | 208,181.00 |
| State Univ. of New York, Stony Brook, NY | (8) | 680,756.00 |
| Swarthmore Coll., Swarthmore, PA | (1) | 13,200.00 |
| Syracuse Univ., Syracuse, NY | (2) | 277,510.00 |
| Temple Univ., Philadelphia, PA | (3) | 259,729.00 |
| Tennessee, Univ. of, Memphis | (2) | 238,988.00 |
| Texas A&M Res. Fdn., College Station | (1) | 160,000.00 |
| Texas Tech. Univ. Health Sciences Ctr. | (1) | 120,000.00 |
| Texas, Univ. of (various locations) | (24) | 2,262,238.00 |
| Tufts Univ., Medford, MA | (5) | 310,291.00 |
| Tulane Univ., New Orleans, LA | (2) | 140,000.00 |
| Université Louis Pasteur, France | (1) | 33,400.00 |
| Utah, Univ. of, Salt Lake City | (4) | 392,485.00 |
| Vanderbilt Univ., Nashville, TN | (5) | 205,273.00 |
| Vermont, Univ. of, State Agr. Coll., Burlington | (2) | 200,354.00 |
| Veterans Admin. Hosp., Bronx, NY | (1) | 38,400.00 |
| Vincent T. Lombardi Cancer Res. Ctr., Wash., DC | (1) | 68,545.00 |
| Virginia, Medical Coll. of, Richmond | (2) | 112,933.00 |
| Virginia, Polytechnic Inst. and State Univ. of, Blacksburg | (1) | 200,000.00 |
| Virginia, Univ. of, Charlottesville | (9) | 911,262.00 |
| W. Alton Jones Cell Science Ctr., Lake Placid, NY | (2) | 375,000.00 |
| Wake Forest College, Winston-Salem, NC | (5) | 544,134.00 |
| Washington State Univ., Pullman | (1) | 25,000.00 |
| Washington, Univ. of, Seattle | (9) | 757,377.00 |
| Washington Univ., St. Louis, MO | (3) | 147,317.00 |
| Wayne State Univ., Detroit, MI | (1) | 59,617.00 |
| Whitehead Inst. Bio-Medical Res., Cambridge, MA | (3) | 170,000.00 |
| Wisconsin, Univ. of, Madison | (13) | 935,016.00 |
| Wistar Inst. of Anat. and Bio., Philadelphia, PA | (4) | 661,212.00 |
| Worcester Fdn. for Experimental Bio., Shrewsbury, MA | (2) | 210,000.00 |
| Wyoming, Univ. of, Laramie | (1) | 40,000.00 |
| Yale Univ., New Haven, CT | (32) | 2,451,087.00 |
| Yeshiva Univ., Bronx, NY | (13) | 816,356.00 |
| Professional Programs of the UICC | (2) | 515,000.00 |
| **SUBTOTAL** | (674) | 57,775,330.00 |
| Division Research Grants | | 2,500,000.00 |
| **TOTAL** | | 60,275,330.00 |

NOTE: Numbers in parentheses indicate number of grants per institution for the year ended August 31, 1984; totals subject to audit.

# THE AMERICAN CANCER SOCIETY

## PROFILE

The American Cancer Society, Inc. is a national voluntary health organization of 2.5 million Americans united to conquer cancer through balanced programs of research, education, patient service and rehabilitation.

**Organization:** The American Cancer Society, Inc. is composed of a National Society, with 58 chartered Divisions and 3,242 Units.

**The National Society:** A 200-member House of Delegates provides a basic representation from the 58 Divisions and additional representation on the basis of population. It elects and is governed by a Board of Directors of 121 voting members, approximately half of whom are members of the medical or scientific professions.

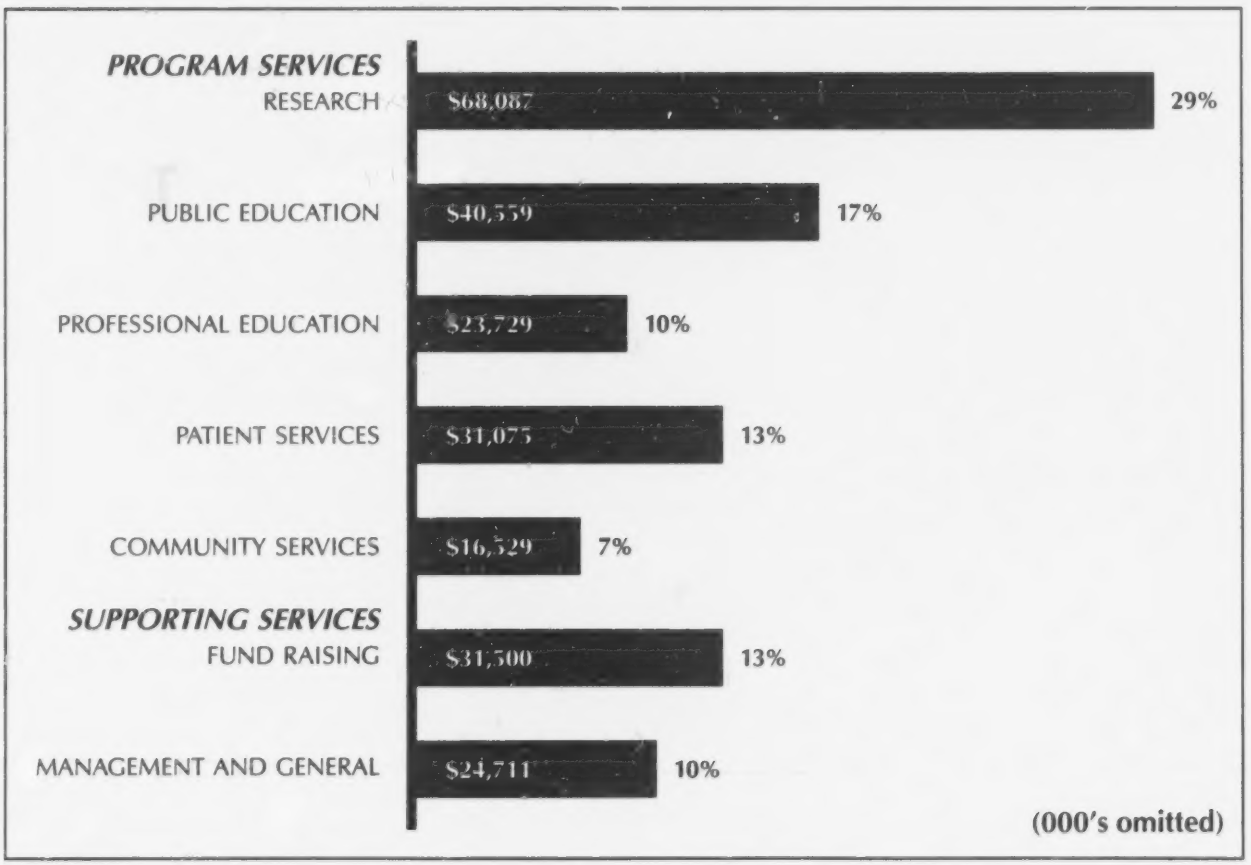
The National Society is responsible for overall planning and coordination, and provides technical help and materials to Divisions and Units. The National Society administers programs of research, medical grants and clinical fellowships, and is charged with carrying out public and professional education on the national level.

**The 58 Divisions:** These are governed by 3,847 members of Divisional Boards of Directors, both medical and lay, in all the states plus six metropolitan areas, the District of Columbia and Puerto Rico.

**The Units:** These are organized to cover the 3,130 counties in the United States. There are thousands of community leaders who direct the Society's programs at this level. The basic strength of the Society lies in the loyal ranks of volunteers fighting cancer in their communities.

**The Programs:** The Society maintains its priorities and goals through activities developed by the departments of Research, Professional Education, Public Education, Public Information, Epidemiology and Statistics, Service and Rehabilitation, and Crusade.

### ALLOCATION OF ACS FUNDS BASED ON TOTAL 1983-1984 BUDGET—$236,190,000




Figures taken from 1983 Annual Report

# SOURCES OF INCOME

Financial support of the American Cancer Society in fiscal 1984 is estimated to exceed $215 million from public sources. The Cancer Crusade raised about $165 million. National Headquarters and chartered Divisions received some $50 million from bequests and legacies. The public has given generous and growing support to the Society over the years. In 1946, for example, funds raised exceeded $10 million. Thirty-five years later, in 1981, that figure had soared to more than $170 million.

Legacies — in which the Society becomes beneficiary of willed funds — are an increasingly important source of ACS income. Income from legacies indicates confidence in the leadership of the Society and a determination by many Americans to continue the fight against cancer even after their lifetimes. Legacy income in relation to Crusade receipts is shown below.

| Year | Crusade | Legacies |
|---|---|---|
| 1974 | 72,152,000 | 24,117,000 |
| 1975 | 78,788,000 | 31,056,000 |
| 1976 | 84,882,000 | 33,968,000 |
| 1977 | 90,120,000 | 24,606,000 |
| 1978 | 95,928,000 | 30,179,000 |
| 1979 | 102,778,000 | 39,361,000 |
| 1980 | 113,325,000 | 41,366,000 |
| 1981 | 124,615,000 | 45,793,000 |
| 1982 | 135,197,000 | 47,800,000 |
| 1983 | 151,181,000 | 51,908,000 |

## CANCER'S SEVEN WARNING SIGNALS

1. Change in bowel or bladder habits
2. A sore that does not heal
3. Unusual bleeding or discharge
4. Thickening or lump in breast or elsewhere
5. Indigestion or difficulty in swallowing
6. Obvious change in wart or mole
7. Nagging cough or hoarseness

*If you have a warning signal, see your doctor.*

# CANCER AROUND THE WORLD, 1978-1979

**Age-Adjusted Death Rates Per 100,000 Population for Selected Sites for 48 Countries**

| COUNTRY | ALL SITES | | ORAL | | COLON & RECTUM | | LUNG | | BREAST | UTERUS | STOMACH | | PROSTATE | LEUKEMIA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | Female | Female | Male | Female | Male | Male | Female |
| United States* | 216.9(18) | 137.7(19) | 5.8(14) | 1.9( 7) | 26.5(15) | 20.2(15) | 70.3( 9) | 19.0( 5) | 27.1(14) | 8.4(37) | 8.6(43) | 4.3(44) | 22.9(13) | 8.7( 7) | 5.2( 6) |
| Argentina* | 215.9(19) | 139.3(17) | 4.5(22) | 0.8(38) | 20.5(24) | 17.5(21) | 54.9(22) | 9.5(16) | 24.7(16) | 14.7(12) | 23.5(26) | 11.6(26) | 18.9(24) | 6.0(28) | 4.4(24) |
| Australia | 212.4(21) | 125.4(29) | 5.4(18) | 1.7(10) | 28.4(11) | 21.8(10) | 62.0(18) | 11.5(14) | 23.2(20) | 7.5(39) | 14.9(39) | 7.2(40) | 22.2(16) | 7.7(17) | 4.6(21) |
| Austria | 247.3( 9) | 147.6(12) | 5.5(17) | 0.8(38) | 32.8( 3) | 21.6(12) | 66.8(12) | 9.3(17) | 23.2(20) | 14.2(14) | 36.8( 8) | 18.5(10) | 22.2(15) | 7.3(21) | 4.8(17) |
| Barbados** | 179.0(30) | 136.1(21) | 9.1( 7) | 1.4(19) | 5.3(41) | 14.4(27) | 12.6(41) | 5.8(34) | 27.4(12) | 30.0( 1) | 33.7(11) | 12.4(23) | 41.0( 1) | 8.9( 3) | 1.4(45) |
| Bulgaria | 156.3(38) | 102.6(37) | 2.5(38) | 0.9(34) | 14.4(31) | 11.1(33) | 43.6(26) | 7.4(25) | 15.8(30) | 9.4(30) | 33.4(12) | 20.5( 7) | 9.0(38) | 5.2(35) | 4.0(31) |
| Canada* | 214.9(20) | 136.3(20) | 6.0(13) | 1.7(10) | 29.7( 9) | 23.1( 8) | 65.5(13) | 14.2(11) | 27.8(11) | 8.5(35) | 14.4(40) | 6.7(42) | 21.9(18) | 8.4( 8) | 5.1(10) |
| Chile | 191.3(26) | 148.5(10) | 3.5(30) | 0.7(43) | 9.6(35) | 9.9(36) | 24.9(36) | 6.8(30) | 14.1(35) | 21.3( 5) | 61.8( 3) | 28.3( 3) | 16.5(29) | 4.4(38) | 4.0(31) |
| Costa Rica | 178.6(31) | 138.3(18) | 3.4(31) | 1.1(27) | 7.7(37) | 8.5(38) | 15.6(40) | 7.1(27) | 9.9(38) | 18.5( 7) | 62.1( 2) | 33.5( 1) | 14.8(31) | 7.1(22) | 6.3( 1) |
| Cuba* | 172.1(34) | 119.1(31) | 9.2( 6) | 2.2( 6) | 13.4(32) | 15.1(25) | 50.1(24) | 16.6( 8) | 17.9(25) | 17.6( 9) | 13.1(41) | 7.1(41) | 23.3(11) | 5.7(30) | 4.1(30) |
| Denmark | 233.3(13) | 172.3( 1) | 4.0(26) | 1.9( 7) | 34.0( 1) | 26.1( 2) | 68.6(11) | 17.2( 7) | 30.6( 6) | 14.4(13) | 18.5(34) | 10.2(31) | 23.2(12) | 9.0( 2) | 5.7( 2) |
| Dominican Rep.* | 53.7(45) | 48.1(45) | 1.9(43) | 1.6(16) | 4.3(43) | 3.7(42) | 5.6(44) | 3.0(44) | 4.1(44) | 8.8(34) | 4.3(44) | 2.2(45) | 8.6(39) | 2.1(44) | 1.5(44) |
| Ecuador* | 87.3(42) | 86.9(40) | 1.2(46) | 0.6(45) | 3.1(44) | 3.9(41) | 5.9(43) | 2.3(45) | 6.0(42) | 23.0( 4) | 31.8(14) | 20.5( 7) | 10.5(37) | 2.9(41) | 2.5(41) |
| Egypt* | 39.0(47) | 18.8(48) | 0.6(47) | 0.2(47) | 2.1(45) | 1.1(47) | 2.5(47) | 1.1(47) | 3.4(45) | 2.0(47) | 1.9(46) | 1.1(46) | 1.5(46) | 2.3(43) | 1.4(45) |
| England & Wales | 248.7( 8) | 156.9( 5) | 3.6(29) | 1.7(10) | 28.4(11) | 21.7(11) | 95.7( 3) | 20.7( 4) | 33.8( 1) | 10.2(26) | 24.0(25) | 11.4(27) | 18.3(25) | 7.0(23) | 4.5(22) |
| Fiji* | 54.0(44) | 79.8(41) | 1.8(44) | 3.4( 3) | 4.7(42) | 3.0(43) | 4.0(45) | 5.7(35) | 7.9(40) | 28.5( 2) | 9.5(42) | 4.9(43) | 3.3(45) | 2.4(42) | 5.2( 6) |
| Finland* | 243.9(10) | 113.9(32) | 3.7(28) | 1.4(19) | 15.7(27) | 13.3(28) | 86.5( 5) | 6.5(31) | 17.6(26) | 8.1(38) | 30.7(16) | 15.0(18) | 24.0( 8) | 8.8( 5) | 4.3(25) |
| France* | 255.7( 6) | 120.8(30) | 18.3( 2) | 1.4(19) | 27.5(13) | 18.1(20) | 51.8(23) | 4.9(41) | 21.9(24) | 10.7(25) | 18.0(35) | 8.6(37) | 22.0(17) | 8.9( 3) | 5.3( 3) |
| Germany, F.R. | 242.0(11) | 152.0( 8) | 4.1(24) | 0.9(34) | 31.3( 5) | 23.9( 7) | 36.0(29) | 7.2(26) | 25.3(15) | 11.5(19) | 30.6(17) | 16.3(12) | 23.9( 9) | 7.8(15) | 5.2( 6) |
| Greece | 188.3(28) | 103.6(36) | 2.2(40) | 0.8(38) | 8.3(36) | 7.7(40) | 58.5(21) | 8.8(18) | 16.2(29) | 7.3(41) | 17.3(36) | 9.8(33) | 11.0(36) | 8.4( 8) | 4.7(20) |
| Guatemala* | 68.6(43) | 78.8(42) | 2.2(40) | 1.0(30) | 2.0(46) | 2.5(44) | 2.7(46) | 2.0(46) | 2.7(46) | 12.6(16) | 21.6(29) | 18.9( 9) | 4.9(41) | 1.5(47) | 1.1(47) |
| Hong Kong | 235.2(12) | 125.5(28) | 20.3( 1) | 7.2( 1) | 19.2(25) | 12.8(29) | 68.9(10) | 30.9( 1) | 10.7(37) | 8.5(35) | 19.6(32) | 9.1(36) | 3.7(44) | 5.5(31) | 3.9(34) |
| Hungary | 269.3( 3) | 162.6( 3) | 8.2( 8) | 1.6(16) | 30.5( 7) | 23.0( 9) | 72.5( 7) | 12.1(13) | 24.6(17) | 18.3( 8) | 44.6( 4) | 20.9( 4) | 24.2( 7) | 7.7(17) | 5.2( 6) |
| Iceland | 150.7(39) | 140.7(16) | 2.0(42) | 2.6( 4) | 16.2(26) | 15.1(25) | 28.3(34) | 16.5( 9) | 27.2(13) | 6.6(44) | 26.3(21) | 12.9(22) | 14.0(33) | 9.6( 1) | 3.7(36) |
| Ireland* | 219.0(17) | 158.8( 4) | 5.7(16) | 1.7(10) | 32.0( 4) | 26.0( 3) | 60.5(20) | 17.8( 6) | 32.1( 4) | 7.3(41) | 21.7(27) | 14.4(19) | 23.9( 9) | 6.3(25) | 4.5(22) |
| Israel | 174.7(32) | 145.9(13) | 1.7(45) | 0.9(34) | 22.7(22) | 18.2(17) | 32.9(31) | 10.5(15) | 28.3(10) | 6.5(45) | 15.9(38) | 9.8(33) | 13.1(34) | 8.8( 5) | 4.8(17) |
| Italy | 228.5(15) | 126.0(27) | 7.3(11) | 1.1(27) | 23.5(21) | 17.5(21) | 61.8(19) | 7.1(27) | 22.3(23) | 11.4(21) | 31.3(15) | 15.7(15) | 15.8(30) | 8.0(12) | 5.1(10) |
| Japan | 190.0(27) | 109.3(33) | 2.4(39) | 0.8(38) | 15.5(29) | 11.4(32) | 31.2(33) | 8.8(18) | 6.0(42) | 9.3(31) | 66.1( 1) | 31.2( 2) | 3.9(42) | 4.8(37) | 3.2(39) |
| Luxembourg | 269.0( 4) | 148.3(11) | 9.7( 5) | 0.3(46) | 31.3( 5) | 24.6( 4) | 87.5( 4) | 8.6(20) | 24.4(18) | 13.0(15) | 26.9(20) | 12.1(25) | 20.7(20) | 7.9(14) | 5.3( 3) |
| Mauritius | 100.0(41) | 71.6(44) | 4.1(24) | 0.7(43) | 5.7(40) | 2.5(44) | 21.2(37) | 5.2(39) | 6.6(41) | 10.5(23) | 21.4(30) | 9.6(35) | 5.4(40) | 1.9(45) | 1.8(42) |
| Netherlands | 266.2( 5) | 144.8(14) | 2.6(36) | 1.0(30) | 26.4(16) | 21.3(14) | 101.2( 2) | 6.8(30) | 31.9( 5) | 9.0(33) | 25.5(22) | 11.3(29) | 24.3( 6) | 8.2(10) | 5.3( 3) |
| New Zealand | 172.0(35) | 154.4( 7) | 4.9(19) | 1.7(10) | 33.3( 2) | 29.5( 1) | 64.4(14) | 16.1(10) | 30.0( 7) | 9.8(28) | 16.9(37) | 7.5(39) | 22.7(14) | 7.6(19) | 5.0(13) |
| Nicaragua* | 22.9(48) | 35.9(46) | 0.0(48) | 0.0(48) | 0.1(48) | 0.5(48) | 1.4(48) | 0.0(48) | 0.0(48) | 0.4(48) | 0.1(47) | 0.5(48) | 0.0(48) | 1.6(46) | 1.8(42) |
| Northern Ireland* | 226.0(16) | 151.7( 9) | 3.3(33) | 1.8( 9) | 28.5(10) | 24.1( 6) | 74.0( 6) | 14.2(11) | 32.5( 3) | 7.5(39) | 24.8(23) | 14.1(20) | 19.3(23) | 8.1(11) | 4.9(15) |
| Norway | 193.8(25) | 130.4(23) | 3.1(34) | 1.1(27) | 24.0(19) | 19.7(16) | 31.7(32) | 6.3(33) | 23.6(19) | 10.2(26) | 21.1(31) | 10.6(30) | 31.1( 3) | 7.8(15) | 4.9(15) |
| Poland | 214.2(22) | 126.2(26) | 5.8(14) | 1.3(23) | 15.2(30) | 11.7(31) | 63.6(16) | 7.9(23) | 16.6(28) | 15.0(11) | 41.0( 5) | 16.2(14) | 12.2(35) | 6.6(24) | 4.2(28) |
| Portugal | 180.1(29) | 108.0(34) | 6.6(12) | 1.3(23) | 22.4(23) | 17.3(24) | 25.4(35) | 4.2(42) | 17.6(26) | 12.3(17) | 40.6( 6) | 20.9( 4) | 21.8(19) | 6.3(25) | 4.3(25) |
| Puerto Rico** | 157.3(37) | 95.1(39) | 10.0( 4) | 1.6(16) | 6.4(39) | 7.9(39) | 19.2(39) | 5.6(37) | 9.2(39) | 7.3(41) | NA | 8.5(38) | 17.6(26) | 5.1(36) | 4.3(25) |
| Romania* | 161.7(36) | 106.0(35) | 3.8(27) | 1.0(30) | 10.2(34) | 9.0(37) | 38.3(28) | 7.0(29) | 14.2(34) | 18.7( 6) | 35.4( 9) | 15.7(15) | 20.2(21) | 5.3(33) | 3.4(38) |
| Scotland | 275.0( 1) | 172.0( 2) | 4.2(23) | 1.7(10) | 30.4( 8) | 24.6( 4) | 113.2( 1) | 27.5( 2) | 33.2( 2) | 9.8(28) | 24.5(24) | 12.3(24) | 17.4(27) | 6.3(25) | 4.2(28) |
| Singapore | 249.6( 7) | 130.4(23) | 16.9( 3) | 5.8( 2) | 23.9(20) | 18.2(17) | 71.9( 8) | 21.2( 3) | 15.5(32) | 11.3(22) | 39.6( 7) | 16.3(12) | 3.9(42) | 4.4(38) | 4.0(31) |
| Spain* | 194.9(24) | 75.1(43) | 4.6(21) | 0.8(38) | 15.7(27) | 12.8(29) | 41.2(27) | 5.0(40) | 15.8(30) | 9.5(29) | 28.7(18) | 15.4(17) | 19.4(22) | 5.4(32) | 3.9(34) |
| Sweden | 198.0(23) | 141.2(15) | 3.4(31) | 1.4(19) | 24.2(18) | 18.2(17) | 34.3(30) | 8.5(21) | 22.9(22) | 9.1(32) | 19.1(33) | 10.0(32) | 31.8( 2) | 8.0(12) | 5.1(10) |
| Switzerland | 230.3(14) | 134.2(22) | 7.6( 9) | 1.3(23) | 25.8(17) | 17.5(21) | 62.6(17) | 5.8(34) | 29.5( 8) | 10.8(24) | 21.7(27) | 11.4(27) | 27.7( 4) | 7.4(20) | 4.8(17) |
| Thailand | 46.2(46) | 30.4(47) | 2.6(36) | 1.3(23) | 1.9(47) | 1.2(46) | 6.5(42) | 4.2(42) | 1.2(47) | 4.2(46) | 2.1(45) | 0.8(47) | 0.2(47) | 0.7(48) | 0.5(48) |
| Uruguay* | 271.8( 2) | 156.2( 6) | 7.6( 9) | 1.0(30) | 27.0(14) | 21.4(13) | 63.9(15) | 5.5(38) | 29.2( 9) | 15.2(10) | 32.6(13) | 16.8(11) | 27.6( 5) | 5.8(29) | 5.0(13) |
| Venezuela* | 135.0(40) | 128.9(25) | 3.1(34) | 2.6( 4) | 7.1(38) | 10.1(35) | 20.4(38) | 8.3(22) | 11.5(36) | 27.7( 3) | 34.0(10) | 20.7( 6) | 16.8(28) | 5.3(33) | 3.6(37) |
| Yugoslavia* | 172.7(33) | 102.4(38) | 4.8(20) | 0.9(34) | 13.1(33) | 10.2(34) | 44.3(25) | 7.6(24) | 14.5(33) | 11.8(18) | 27.9(19) | 13.8(21) | 14.7(32) | 3.9(40) | 2.8(40) |

NOTE: Figures in parentheses are order of rank within site and sex group. *1978 only. **1979 only. NA: Not available Source of data: World Health Statistics Annual 1980-1982

# COMPREHENSIVE CANCER CENTERS

The institutions listed have been recognized as Comprehensive Cancer Centers by the National Cancer Institute. These centers have met rigorous criteria imposed by the National Cancer Advisory Board. They receive financial support from the National Cancer Institute, the American Cancer Society and many other sources.

**ALABAMA**
University of Alabama in Birmingham Comprehensive Cancer Center
Lurleen Wallace Tumor Institute
1824 6th Avenue South
Birmingham, Alabama 35294
Phone: (205) 934-5077

**CALIFORNIA**
University of Southern California Comprehensive Cancer Center
1441 Eastlake Avenue
Los Angeles, California 90033-0804
Phone: (213) 224-6416

UCLA-Jonsson Comprehensive Cancer Center
Louis Factor Health Sciences Bldg.
10833 LeConte Avenue
Los Angeles, California 90024
Phone: (213) 825-5268

**CONNECTICUT**
Yale Comprehensive Cancer Center
Yale University School of Medicine
333 Cedar Street
New Haven, Connecticut 06510
Phone: (203) 785-4095

**DISTRICT OF COLUMBIA**
Georgetown University/Howard University Comprehensive Cancer Center

☐ Vincent T. Lombardi Cancer Research Center
Georgetown University Medical Center
3800 Reservoir Road, N.W.
Washington, D.C. 20007
Phone: (202) 625-7721

☐ Howard University Cancer Research Center
College of Medicine
Department of Oncology
2041 Georgia Avenue, N.W.
Washington, D.C. 20060
Phone: (202) 636-7697

**FLORIDA**
Comprehensive Cancer Center for the State of Florida
University of Miami School of Medicine
1475 N.W. 12th Avenue
Miami, Florida 33101
Phone: (305) 545-7707

**ILLINOIS**
Illinois Cancer Council
36 South Wabash Avenue, Suite 700
Chicago, Illinois 60603
Phone: (312) 346-9813

☐ Northwestern University Cancer Center
303 East Chicago Avenue
Chicago, Illinois 60611
Phone: (312) 266-5250

☐ University of Chicago Cancer Research Center
950 East 59th Street
Chicago, Illinois 60637
Phone: (312) 962-6180

☐ University of Illinois
Department of Surgery, Division of Surgical Oncology
840 South Wood Street
Chicago, Illinois 60612
Phone: (312) 996-6666

☐ Rush Cancer Center
Suite 820
1725 West Harrison Street
Chicago, Illinois 60612
Phone: (312) 942-6028

**MARYLAND**
Johns Hopkins Oncology Center
600 North Wolfe Street
Baltimore, Maryland 21205
Phone: (301) 955-8822

**MASSACHUSETTS**
Dana-Farber Cancer Institute
44 Binney Street
Boston, Massachusetts 02115
Phone: (617) 732-3555

**MICHIGAN**
Michigan Cancer Foundation
Meyer L. Prentis Cancer Center
110 East Warren Avenue
Detroit, Michigan 48201
Phone: (313) 833-0710

**MINNESOTA**
Mayo Clinic
200 First Street, S.W.
Rochester, Minnesota 55905
Phone: (507) 284-8964

**NEW YORK**
Columbia University Cancer Research Center
701 West 168th Street, Rm. 1208
New York, New York 10032
Phone: (212) 694-3647

Memorial Sloan-Kettering Cancer Center
1275 York Avenue
New York, New York 10021
Phone: (212) 794-6561

Roswell Park Memorial Institute
666 Elm Street
Buffalo, New York 14263
Phone: (716) 845-5770

**NORTH CAROLINA**
Duke Comprehensive Cancer Center
P.O. Box 3814
Duke University Medical Center
Durham, North Carolina 27710
Phone: (919) 684-2282

**OHIO**
Ohio State University Comprehensive Cancer Center
Suite 302
410 West 12th Avenue
Columbus, Ohio 43210
Phone: (614) 422-5022

**PENNSYLVANIA**
Fox Chase/University of Pennsylvania Cancer Center

☐ The Fox Chase Cancer Center
7701 Burholme Avenue
Philadelphia, Pennsylvania 19111
Phone: (215) 728-2781

☐ University of Pennsylvania Cancer Center
3400 Spruce Street
7th Floor, Silverstein Pavilion
Philadelphia, Pennsylvania 19104
Phone: (215) 662-3910

**TEXAS**
The University of Texas System Cancer Center
M.D. Anderson Hospital and Tumor Institute
6723 Bertner Avenue
Houston, Texas 77030
Phone: (713) 792-6000

**WASHINGTON**
Fred Hutchinson Cancer Research Center
1124 Columbia Street
Seattle, Washington 98104
Phone: (206) 292-2930 or 292-7545

**WISCONSIN**
Wisconsin Clinical Cancer Center
University of Wisconsin
Department of Human Oncology
600 Highland Avenue
Madison, Wisconsin 53792
Phone: (608) 263-8610

# CHARTERED DIVISIONS OF THE AMERICAN CANCER SOCIETY, INC.

**Alabama Division, Inc.**
402 Office Park Drive
Suite 300
Birmingham, Alabama 35223
(205) 879-2242

**Alaska Division, Inc.**
1343 G Street
Anchorage, Alaska 99501
(907) 277-8696

**Arizona Division, Inc.**
634 West Indian School Road
P.O. Box 33187
Phoenix, Arizona 85067
(602) 234-3266

**Arkansas Division, Inc.**
5520 West Markham Street
P.O. Box 3822
Little Rock, Arkansas 72203
(501) 664-3480-1-2

**California Division, Inc.**
1710 Webster Street
P.O. Box 2061
Oakland, California 94604
(415) 893-7900

**Colorado Division, Inc.**
2255 South Oneida
P.O. Box 24669
Denver, Colorado 80224
(303) 758-2030

**Connecticut Division, Inc.**
Barnes Park South
14 Village Lane
P.O. Box 410
Wallingford, Connecticut 06492
(203) 265-7161

**Delaware Division, Inc.**
1708 Lovering Avenue
Suite 202
Wilmington, Delaware 19806
(302) 654-6267

**District of Columbia Division, Inc.**
Universal Building, South
1825 Connecticut Avenue, N.W.
Washington, D.C. 20009
(202) 483-2600

**Florida Division, Inc.**
1001 South MacDill Avenue
Tampa, Florida 33609
(813) 253-0541

**Georgia Division, Inc.**
1422 W. Peachtree Street, N.W.
Atlanta, Georgia 30309
(404) 892-0026

**Hawaii Pacific Division, Inc.**
Community Services Center Bldg.
200 North Vineyard Boulevard
Honolulu, Hawaii 96817
(808) 531-1662-3-4-5

**Idaho Division, Inc.**
1609 Abbs Street
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**NATIONAL HEADQUARTERS: AMERICAN CANCER SOCIETY, INC., 90 PARK AVENUE, NEW YORK, N.Y. 10016**

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